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ABSTRACT

This theme issue of "Research and Creative Activity" features six articles on Indiana University faculty whose work on various campuses continues to broaden and advance knowledge about "Literacy and Learning". The articles are as follows: "New Ways to Teach Reading" (about the work of John McEneaney, Assistant Professor of Education, in designing computer programs to diagnose reading problems); "The Legal Parameters of Learning" (about the work of Martha McCarthy, Professor of Education, a leading researcher in the study of education law); "Worldwide Literacy: It's a Matter of Time" (about Harbans Bhola, Professor of Education, who brings 25 years of experience to the international literacy movement); "The Gift of Language" (about the cochlear implant work of Richard T. Miyamoto, Chairman and Arilla DeVault Professor, Department of Otolaryngology-Head and Neck Surgery, Indiana University School of Medicine); "Assessing Achievement" (about the innovative reading assessment tests developed by Roger Farr, Professor of Education, Indiana University Bloomington); and "Indiana at Risk" (about the efforts of Carlyn Johnson, Professor of Public and Environmental Affairs, Indiana University-Purdue University at Indianapolis to remove the flaws in Indiana's school funding sytstem in order to achieve statewide equality of educational opportunity. (SR)

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Research, both pure and applied, and creative activities are ongoing and essential aspects of life on the campuses at Indiana University. The quality of instructional education at any institution is tremendously enhanced if based upon and continuously associated with research and creative inquiry. It is significant, therefore, that the emphasis at IU not only is placed upon fundamental and basic research but also is directed toward developmental activities designed to discover those applications of research that characterize the efforts of many of our faculty in the arts and sciences as well as the professional schools.

As an overview of the diverse and interesting programs of research, scholarship, and creative activities conducted at Indiana University, *Research & Creative Activity* offers its readers an opportunity to become familiar with the professional accomplishments of our distinguished faculty. We hope the articles that appear in *Research & Creative Activity* continue to be intellectually stimulating to readers and make them more aware of the great diversity and depth of the research and artistic creativity underway at Indiana University. A full and exciting life is being created here, now and for the future. From our readers we welcome suggestions for topics for future articles in *Research & Creative Activity* that will demonstrate further the scholarly activity at Indiana University.

Research & Creative Activity
Indiana University

Volume XV Number 2
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From the Editor

Our country is going through what some consider to be the worst recession in 50 years. The current economic conditions have undermined the confidence of the people who work to produce the wealth of the nation. To add insult to injury, foreign politicians not only criticize the work ethic of the American worker, but also blame America's economic problems on the "high rate of illiteracy" among the American work force. Jonathan Kozol, in his book *Illiterate America*, reports that over 25 million adults in this country cannot read or write and that another 35 million are functionally illiterate—they cannot read above a ninth-grade level. Functional illiteracy in this country costs more than $225 billion dollars annually in lost industrial productivity, unrealized tax revenues, remedial reading and training, and illiteracy related to crime and welfare, according to figures from the National Coalition for Literacy. In our own state of Indiana, as many as 20 percent of the population may be functionally illiterate. And we still have the third largest net out-migration in the country because the better-educated and the higher-skilled workers continue to leave the state. All of these facts force us to look more closely and carefully at the issues of literacy and learning.

This issue of *Research & Creative Activity* features six Indiana University faculty whose work continues to broaden and advance our knowledge about literacy and learning.

Professor Harbans Bhola in his book, *Literacy Work at the Grassroots*, writes, "Literacy has become a fashionable word. These days all reading, in all settings, is called literacy. Children are not learning to 'read' as they used to! They are now learning 'literacy!' Adults are learning literacy as well." He goes on to suggest that literacy may be defined in a number of different ways: "cultural literacy," "scientific literacy," "political literacy," and "computer literacy."

UNESCO defines literacy as "the ability to read and write in the mother tongue." Cathy Rogers, program director of Volunteers in Tutoring Adult Learners (VITAL), a community-based program in Bloomington, Indiana, has a very practical definition of literacy: "A person is literate when he or she can function effectively in daily life." Ms. Rogers's definition encompasses the definition of literacy established by the 1986 National Assessment of Education Progress (NAEP): "Literacy is the ability to use printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential."

Professor Roger Farr characterizes literacy as "the degree to which someone is able to merge all the language systems—reading, writing, listening, speaking, and possibly a skill called mathematical or scientific thinking." He believes that thinking is one of the most important factors in literacy and learning, and something that is not assessed by current evaluative tools—standardized tests. Farr's research efforts have been directed toward the development of literacy tests that emphasize the connections between reading and writing.

Professor John McEneaney is using computer technology in his quest to uncover the mysteries of how children learn to recognize letters and words and put them together to read. His computer-based program enables teachers to diagnose reading problems and provide solutions to correct the problems. He is addressing basic questions about learning while providing tools for improvements in diagnosis and remediation.

The potential for higher learning may be lost due to inadequate preparation in schools. Professors Martha McCarthy and Carlyn Johnson have combined their efforts in establishing the Indiana Education Policy Center to improve the educational experiences of Hoosier children. McCarthy investigates "ways in which legal decisions affect the quality of public education, the success of high school graduates, and ultimately, the level of education of our citizenry." Johnson focuses on legislative appropriations to schools in Indiana and is a champion of schools's rights to decide how and when the dollars need to be spent.

Unlike others who are trying to improve the level of literacy in the general population, Dr. Richard Miyamoto's work in cochlear implants provides new hope for the deaf, who may, according to Miyamoto, "graduate from high school with about a fifth-grade reading level because it's difficult to develop reading skills when you're totally deaf." Instead of a limiting themselves to the visual, some deaf people are now able to expand their world to include even telephone conversations, thanks to the work of researchers such as Miyamoto.

In their own unique ways, researchers featured in this issue of *R&CA*, and many others, continue to study and promote ways of improving the basic and growing needs of a literate society.

P. Sarita Soni, Associate Dean
Research and the University Graduate School

New Ways to Teach Reading

John McEneaney, Assistant Professor of Education, Indiana University at South Bend

Why can't little Johnny (or, these days, Jennifer or Jason) read? It's a question that has plagued generations of parents, teachers, and researchers all over the world. Utilizing computer programming, artificial intelligence, and years of field experience in the classroom, John McEneaney, assistant professor of education, Indiana University at South Bend (IUSB), has come up with some answers, and some new ways of teaching reading.

McEneaney's research and programming skills have resulted in several computer programs with applications in educational research and practice. One program, which was part of his dissertation, simulates the learning of letters and words by beginning readers.

The program's foundation goes back to basic theories of how children learn to recognize letters and words. "One of the traditions of education is that this is a rote sort of task," says McEneaney. "You put an alphabet up in your classroom, or you teach words with flash cards." If learning to read begins with rote memorization, McEneaney reasoned that a computer ought to be programmable to mimic the learning process.

"I started with a general theory of letter and word perception that has been around for some time," he says. "The idea is that children learn to recognize letters based on smaller units, such as the line segments that make up a letter. The theory holds that we break down letters into their components, then put the strings of letters into words, and we begin to associate visual patterns with specific words."

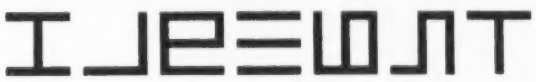
The letter-perception theory had long been available. "It was something people had intuitive notions about, and my research extended it and made it explicit in ways that hadn't happened before," McEneaney says. To create the computer program, McEneaney used a logic-based language called Prolog. Writing in Prolog, which he'd learned during his graduate study at the University of Georgia, he broke the entire alphabet down into segments of letters. Assuming the truth of the letter-perception theory, McEneaney added a concept called unification-based matching. "When they are learning letters and words, kids are creating patterns, which specify that if it's got this set of characteristics, it's a B, and so on, at whatever level—the letter, the word, even longer units," McEneaney says. "How do you match the patterns you have in your head with the ones your visual system presents to you? You could look for an exact, perfect match, or you could look for a piece or aspect of the information that you can understand."

The human mind seldom depends on an exact match of its expected visual pattern, McEneaney points out. "That's why proofreading is so difficult. You just read right through the errors and don't notice them, because you see the word you expect. The patterns you have in your head take precedence over what's being presented to you." But what if the child is a new learner, and has no set pattern already in mind? "Beginning readers have to be taught the patterns, and they can't take in everything all at once, so they zero in on some aspect of the character that's meaningful to them."

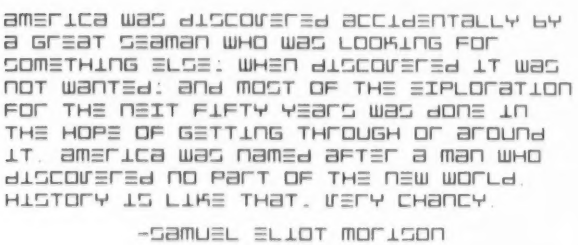
For example—and McEneaney's computer program "learns" to read this way, too—in learning the letter A, a child might focus on its two-leggedness. "That's the pattern he or she creates," McEneaney says. "The mind is saying, 'I'm looking for these two legs,' which works fine until encountering H, and then the child would make an error." At that point, the child would elaborate on the original pattern, realizing that A, unlike H, is connected on top. Future

11 Frank had been expecting a let-
ter from his brother for several days;
so as soon as he found it on the kitchen
table he ate it as quickly as possible.

Try reading these cropped passages. According to McEneaney, most people find the passage that uses the top half of letters easier to read than the one that uses the bottom half. It appears, he says, that top-half letter features are more "informative" than those in the bottom half.



Can you identify the letters in the string of unusual characters in this figure? Each character represents a single letter, but the translation into standard letters is not immediately obvious in every case.


AMERICA WAS DISCOVERED ACCIDENTALLY BY
A GREAT SEAMAN WHO WAS LOOKING FOR
SOMETHING ELSE. WHEN DISCOVERED IT WAS
NOT WANTED. AND MOST OF THE EXPLORATION
FOR THE NEXT FIFTY YEARS WAS DONE IN
THE HOPE OF GETTING THROUGH OR AROUND
IT. AMERICA WAS NAMED AFTER A MAN WHO
DISCOVERED NO PART OF THE NEW WORLD.
HISTORY IS LIKE THAT. VERY CHANCY.
-SAMUEL ELIOT MORISON

Although the letters individually are hard to recognize, this passage can be read without much difficulty, says McEneaney. By applying various contexts (syntax, semantics, and background knowledge), recognition of these curious letter forms is almost automatic. Also, the isolated letters in the example above should now be easier to recognize.

encounters with the two letters would not be difficult, provided the learning process was working.

Other kinds of mistakes, and more complicated ones, can be made by children learning to read. What makes his computer model interesting, McEneaney explains, is that it, too, can make the same types of errors. "Essentially I was trying to come up with a model that could serve as a teaching laboratory, a way of experimenting with different models of learning and teaching. If you let the program run, it leads to some ideas about why kids experience difficulties learning to read, and what we can do about those difficulties."

One of the strengths of McEneaney's computer simulation is its remarkable flexibility in the face of three seemingly conflicting notions about how we learn to perceive letters and words. "I believe, based on what I've studied and on my own experience, that kids can learn in a number of ways," McEneaney says. "Yet one theory holds that we perceive words a letter at a time. It's as if there's a register in your head, keeping track of each letter until you come up with the word." Research cast doubt, however, on the universal truth of that theory by showing that subjects could be presented with degraded visual stimuli—words so distorted that no single letter could be conclusively identified—and still recognize the word.

At the other end of the theoretical spectrum is the idea that words are recognized as whole units rather than as strings of individual letters. In the middle ground between these two extremes are the theorists who claim that readers make use of groups of letters or syllables in recognizing words.

While the theories may seem mutually exclusive, McEneaney's computer simulation can embrace all of them, depending on what input is provided. "I find myself coming down in this debate as a theorist with specific practical concerns," McEneaney says. "I'm willing to adopt whatever approach is required to help a given student."

In recent years, reading theorists have pursued new ideas. "There's been a lot of interest among many of us in this field to change the way we refer to ourselves, from reading educators to literacy educators," McEneaney says. "That reflects a broadening of what we think about reading. In the whole language movement, we're trying to teach kids to read starting from the big picture, which is to get meaning, to enjoy their lives, to become lifelong readers. The danger of phonics and the other skills-based approaches was that they tended to compartmentalize what teachers were doing, as opposed to recognizing reading in the broader sense."

The whole language approach offers a more sophisticated, global view of the learning process, according to McEneaney, "but there is some question as to whether it provides enough structure for children who have problems or who aren't good self-organizers to begin with. Whatever our instructional philosophy, the first step in teaching is to understand our students and to anticipate their difficulties, so that we can assure their success." Thus, with that goal in mind, McEneaney stands by his computer model, which can help us better understand the difficulties children encounter learning to read.

Having devised a still-evolving but satisfactorily functioning computer model, McEneaney faced the question of how best to utilize his insights. His response was to develop a second, related program that focuses specifically on diagnosing the problems that children commonly experience in learning to read.

McEneaney's recent work is based on expert systems, computer programs that simulate an expert in some specific field and offer users advice and suggestions about how to solve problems. "Expert systems have been widely applied in a variety of fields, including manufacturing, medicine, and finance," says McEneaney. "One common application is diagnosing problems and recommending solutions. It seemed reasonable to me to think that this kind of technology could contribute to diagnosis and problem-solving in educational settings."

McEneaney refers to his expert system for reading diagnosis as TA, Teacher's Aide. TA begins with a teacher or diagnostician entering data for a student from both informal and standardized reading tests. Informal data include information about the oral reading

Modern theories of letter and word perception frequently make the assumption that letters and words are composed of still more elemental perceptual features. By this account, a letter is made up of a set of oriented features, and words are composed of sequences of letters or feature sets. This conceptualization of letters and words as composed of simpler feature elements has a long tradition of use, in part, because it provides a convenient starting point for model building by establishing the "atomic" elements with which the perceptual theory must deal.

It turns out, however, that letter and word perception is much more than the simple registration and summation of perceptual features. Ever since the early days of reading, research investigators have known about context effects in letter and word perception. In one important study carried out a hundred years ago, it was discovered that subjects could recognize words under conditions of visual degradation that made recognition of individual letters impossible. One explanation was that subjects might use the shape of words as an aid to recognition (and word shape can, in fact, aid perception), but more recent studies suggest that letters in words are actually more perceptible than letters by themselves or in non word contexts. Moreover, this perceptibility advantage has been observed in non words that are word-like (pseudowords); even nonsense words a la Lewis Carrol ("Twas brillig and the slithy toves") or James Joyce ("while they went doublin their mumper") seem to enjoy this advantage.

There is even evidence that context can play a critical role in registration and categorization of visual feature elements. Readers viewing the display in the figure below have little difficulty interpreting identical visual displays (in this case, the letters "H" and "A") in very different ways depending on the surrounding context. Although these characters are visually identical, you probably had no difficulty recognizing this phrase.

One implication of these findings for educators is that the right context, including the reader's background experiences, knowledge, etc., may be as important a determinant in successful reading as the ability to apply reading skills. This is, in effect, the core of the whole language movement in reading education, which advocates an emphasis on reading for personal meaning and a de-emphasis on abstract skills. Even social and cultural contexts may make important contributions to literacy. Our children may actually learn many of their most important lessons about reading in the years *before* they come to school.

—John McEneaney

miscues or errors of a student and the ability of the student to respond to comprehension questions following reading. Formal data include standardized test scores and measures of general ability and language. Occasionally, TA will interrupt data entry to ask the teacher additional questions about the student's reading. For example, it might stop a teacher to ask if the words that are being misidentified are visually similar to the original words or if mistakes seem to be based on the context in which the words appear. After processing all of the available information, TA provides a diagnosis of the student's reading problems and suggests instructional strategies that may be useful in remediation.

McEneaney's obvious enthusiasm for technology in education, however, is tempered with some reservations about the way technology is sometimes applied in school settings. "A great deal of software has been sent out to the schools but hasn't been used effectively, in part because teachers weren't trained adequately in how technology can be used in the classroom," McEneaney says, "so I have been working on software for teachers rather than for students, and have made an effort to incorporate technology in my teaching in the teacher education program here at IUSB."

Utilization of technology lags far behind the development of software and media at present, but McEneaney hopes that a new generation of teachers, trained on his software and many other technological packages, will change that. "Not every school system has a reading specialist who can sit down and do a careful diagnosis of a student who is having reading problems. Teachers need to know how to screen for these problems, and I want it to be possible for them to do that."

McEneaney's ongoing refinements of the system will help make it more user-friendly. He is now developing a graphics-based output for the program, which will make the diagnoses and suggestions more instantly comprehensible for the teacher. "Tables of numbers have a way of masking trends and patterns in data," says McEneaney. "Graphic output will capitalize on the human capacity for visual pattern recognition, and thus lead to better understanding of students's reading problems."

The use of computers in instruction, particularly in solving problems for teachers, has left McEneaney facing a challenge from non-computer-oriented colleagues. "They say, 'This is an interesting idea, but aren't you afraid that teachers will stop thinking? That they'll get this software and just let

Although the visual degradation of both the top and bottom figures is the same, it is impossible to identify Abraham Lincoln's right ear without the context of the whole figure.

the machine decide what to do?' " Admittedly, McEneaney says, "That is a concern. Any time you have technology that offers advice, you're tempted to take it. Part of the reason we had the big stock market crash in 1987 was that somebody's machine went into a sell mode, and all of a sudden every machine on the block was selling! So we do have to be careful—machines don't have enough common sense to know when things have gone radically wrong. They just keep making wrong decisions one after another."

In the stock market crash, the costs were very high, but in education, where the issue is children, not money, "it becomes a question of professional ethics. Educators—not machines—need to make decisions about what kids need and what kind of instruction they should get," McEneaney says. Thus, his software doesn't "fix" a child's reading problem but suggests ways that a teacher might proceed. "We've come to the place where educators need to be adopting some of these new tools. More educational software needs to be developed by people who understand what learning is about," McEneaney asserts. "A lot of what's out there is technically sophisticated and looks great from the programmer's point of view, but we need more than that. We need to get programmers and educators working together."

Part of the barrier between computers and educators is the abstract nature of most computer applications and languages. Recently, McEneaney has been exploring a new area called connectionism, in which computers operate similarly to the neural networks that make up the brain. "In the connectionist approach, you have input neurons, such as the cells in the retina, which are sensitive to light; when exposed to it, they fire, and those cells are connected to other neurons, which are connected to others in an enormous web. At the input end, the signals come in, and at the output end, you get something like the realization that I recognize this letter A."

Unlike logic-based models such as McEneaney's letter and word learner, "there's no analysis involved. It's all in the way these neurons are connected." Surprisingly, connectionist networks work well at pattern recognition and may hold considerable promise in mimicking learning patterns, even though, as McEneaney says, "they don't provide any explanation for what they do. They just do it, and often quite well."

Connectionism is not entirely a mystery, however. McEneaney has already built a computer program to recognize letters through neural networks. "Still, you can't trace back and find a reason why it happens. In one recent paper, I was considering what this controversy between logic and connectionism suggests about education. Should we prefer one or the other of these approaches? My own preference is for the logic, because I think of teaching as a rational enterprise. We have to have reasons for why we do things, and we ought to be able to explain those reasons. It may turn out that the brain works in a connectionist way, but that may not be useful to us. We need an understandable, interpretable theory of education, not simply an abstract model that doesn't result in anything. This issue has big implications for how we build models of cognition and how we think about teaching."

Although he has reservations about the utility of connectionist machines in teaching, McEneaney has found an application in one area, assessing the readability or difficulty level of text. Traditionally, reading levels have been assigned based on quantifiable criteria, such as the number of syllables or long words in a given passage.

"These formulas are notoriously inaccurate sometimes," McEneaney says. "I'm much more comfortable with an expert teacher who has taught fourth grade for 20 years. If she says a given passage isn't fourth-grade level, I'd put a lot of stock in that. And what she's doing is a global model—pattern recognition on a very high level—which is also what connectionist networks are very good at." McEneaney's new connectionist machine would substitute its complex neural network for the old, formula-based approach and arrive at a conclusion about the level of a text. "I don't have any illusions about this being a theory of reading," he says, "but if it does a better job than something else, such as the old formulas, then it's worth pursuing."

For now, how sophisticated connectionist networks might become and how useful in reading education they might be, are a long

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way from being known. But they do promise much in the way of providing sophisticated models of cognition. Cognitive thinking alone, however, no matter how advanced, is not enough to satisfy McEneaney. While his own work in developing user-friendly interactive computer programs might suggest a bias toward programmed instruction, he believes the learning process is too complex for that kind of model.

"As a tutor in a literacy program in St. Joseph County, and as a new father, I've become much more aware of the social dimension of learning," McEneaney says. "Reading is a social act; it's not just a cognitive skill; it's a club everyone who can do it belongs to, and we all use it every day. My daughter is only a year old, and already she enjoys being read to."

When McEneaney's students go out into the schools, they spend half their time on direct systematic instruction, and the other half just reading to the student, and being read to by the student, in a much less structured way. "Kids need an opportunity to read and be read to, even older kids. From a cognitive perspective, we are all individuals who learn in ways unique to us, and we need some of our instruction to be individual. But I don't think the ideal is to take a kid and plug his face into an opening in the wall. That misses the social dimension entirely."

Working with an adult learner who cannot read has given McEneaney a new appreciation for the importance of reading. "Reading came easily to me as a child, and I took it for granted, but this man I'm working with is an adult with a job and a family; he owns a house and all that, but he can't read, and in many ways, to him the world is like a puzzle," McEneaney says. "When a conversation makes reference to something written—a sign, a magazine, a newspaper article, he knows how to maintain his end of a conversation by reflecting everything you say back to you, like a therapist, and he's developed remarkably sophisticated strategies for understanding labels at the grocery store, but he's acutely aware of his difficulty. He has a sense of how much there is to miss."

Through the innovative work of John McEneaney and others like him, perhaps there will be fewer adult illiterates in the years ahead. He began his work as a teacher after graduating from the University of Michigan with a major in geology and a minor in math. Working without an education degree in a classroom of children with difficulties left him feeling "overwhelmed," says McEneaney. "I was working with tenth graders who were reading at the second-grade level. How could I begin to address this? I'm a person who sort of leans toward the theoretical, but I'm also interested in the real world of the classroom, and what happens there every day." Following up on his interests, he pursued graduate study in reading education at the University of Georgia, where he also learned computer programming and advanced logic. Throughout his career, he's kept up an interest in the Russian language, which is now developing into his latest research interest.

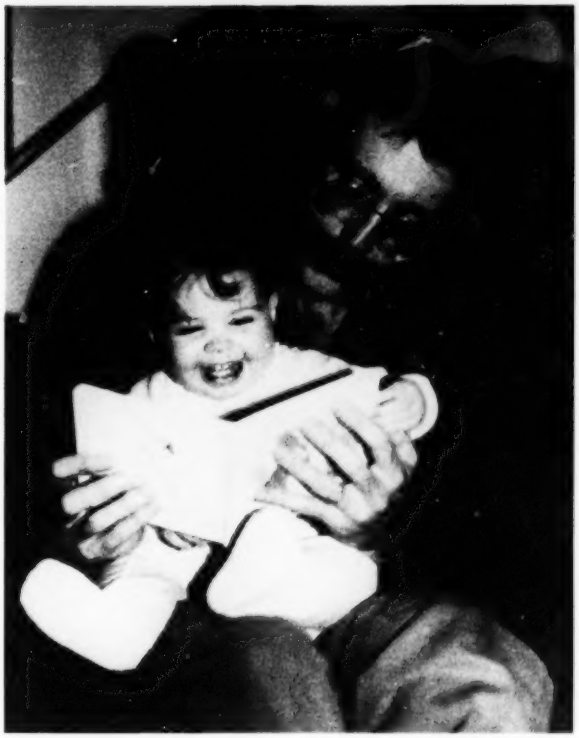
Last summer, McEneaney conducted a review of published Soviet research in educational psychology from 1982-89, seeking to ascertain whether there was a change after the advent of *perestroika* in 1986. "One difference was that there was a shift away from ideologically-based position papers toward an increase in research devoted to atypical individuals, or people with problems," McEneaney says. "One interpretation is that with democratization, you get a higher emphasis on the individual. It could also be that you get more 'negative' research in a democratic society—a focus on problems and difficulties."

McEneaney is also working with Phi Delta Kappa and the IU Institute for the Study of Soviet Education on projects that will help disseminate research results across the two cultures, set up libraries of reading materials, and provide educators in both societies with new insights. The Soviets, McEneaney points out, have been working for universal literacy for over 70 years, having attempted to forge one society out of cultures with more than 100 different native languages. "Certainly there is an enormous amount there to be learned, both cognitively and socially."

While the Russian project is not yet directly related to his computer software development, McEneaney "would like to think that this work has the potential to contribute to a better understanding of the universals of reading. We teach our kids to understand how to read in English, and presumably there are cognitive universals behind that, but you can't know what they are until you look at reading instruction in other languages. Ultimately, I would like to generalize the model to other languages."

Like most researchers, John McEneaney is not certain where his work will take him next, which is part of the challenge. "It's not accidental that I took my degree in reading education," he says. "Reading is a very big thing."

—*Michael Wilkerson*



John McEneaney with daughter Kathleen. Says McEneaney, "Reading is a social act; it's not just a cognitive skill; it's a club everyone who can do it belongs to, and we all use it every day. My daughter is only a year old, and already she enjoys being read to."

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Martha McCarthy, Professor of Education, Indiana University Bloomington

The Legal Parameters of Learning

It is nine o'clock and Martha McCarthy is still at work. The tenure-promotion committee meeting adjourned late. The galleys for the third edition of her book, *Public School Law: Teachers' and Students' Rights*, still need to be scrutinized; they must be returned to the publisher by the end of the week. At the back of her mind is an idea for a new article on censorship, the thread of which emerged from a discussion in a graduate seminar that afternoon. She jots down a few notes to trigger her memory, and settles back to the galleys. In her secluded office in the School of Education building—a labyrinth of varnished hallways that evokes childhood memories—McCarthy is shaping the future of American education law.

Since she joined the Indiana University faculty in Bloomington in 1975, McCarthy, professor of education and co-director of the Indiana Education Policy Center, has been helping Indiana legislators, educators, and business and community leaders make informed decisions about education policy. A dynamic teacher whom students rely on for comprehensive, up-to-date analyses of education law, McCarthy is an equally productive researcher and administrator. She has published seven books since 1979. She has contributed chapters to 26 books on subjects ranging from leadership in American schools to desegregation. The number of her published articles is staggering—more than 150 in the past 15 years.

Finding out about McCarthy's work is like listening to a fast-forward edition of "All Things Considered." She is informed, enthusiastic, and professionally involved with almost any problem that concerns educators in America today. "I knew from the time I was very young that I wanted to be an educator," she recalls. "Even as a sixth grader, I went down and helped the first grade teacher." She graduated from the University of Kentucky in three years and landed a job in Lexington, teaching the fifth grade. Her abilities brought her an award as an outstanding teacher of disadvantaged youth. McCarthy then moved on to a master's degree and administrative work with Project Focus, an inner-city teaching and curriculum project for the Louisville Public Schools. Knowing that she would need a doctorate to keep working as an administrator, McCarthy enrolled at the University of Florida. It was there that she developed her skills in educational administration and found an interest in what she describes as her "primary professional love"—education law.

McCarthy's research in legal issues and education covers topics as diverse as student discipline, financing elementary and secondary education, and religion in the public schools. She examined the application of the First Amendment to public education in *A Delicate Balance: Church, State, and the Schools* (1983). In 1984, less than 10 years after she began teaching education law, McCarthy was elected president of the National Organization on Legal Problems of Education (NOLPE), a professional organization that has both attorneys and professors in its membership. As the 1990-91 recipient of the Indiana University Tracy M. Sonneborn Award, McCarthy was recognized for her outstanding teaching and research. Colleagues in the fields of law and education regard her as the country's foremost analyst of legal issues in education.

McCarthy has made an international name for herself in the field of educational administration. Ten years ago she was instrumental in creating the Indiana Network of Women Administrators, a vital support organization that now has over 150 members. In 1985, one year after she assumed the presidency of NOLPE, she was the first woman to be elected president of the University Council for

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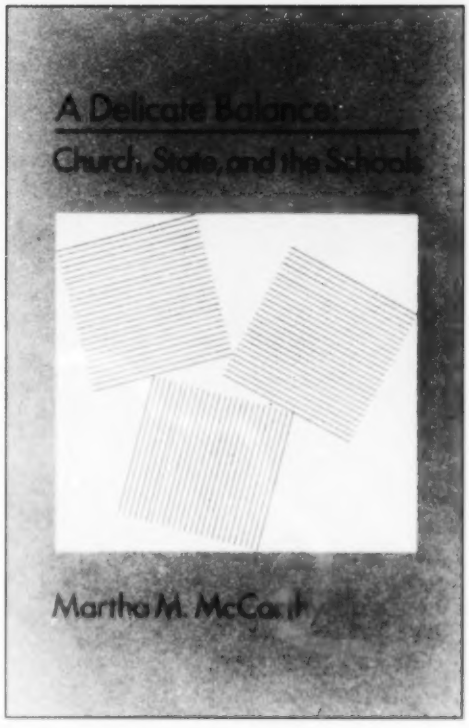
Educational Administration (UCEA), a consortium of the 50 major research institutions with educational administration graduate programs. In 1986 she served as guest editor of the *Educational Administration Quarterly*, the leading research journal in the field. She also directed the most comprehensive study of the educational administration professoriate to date, *Under Scrutiny: The Educational Administration Professoriate* (1988).

From 1986-1990 McCarthy was in charge of the Indiana University Consortium on Educational Policy Studies, established to provide research-based information on key education issues and policy options to policy makers and education leaders—to join researchers, policy makers, and practitioners in what McCarthy calls "a common cause." In 1990 a major grant from the Lilly Endowment, Inc., joined the Bloomington consortium and the School Finance Project of the School of Public and Environmental Affairs at IUPUI to create the Indiana Education Policy Center. Co-Director McCarthy and Associate Director Gayle Hall manage the Bloomington office and Co-Director Robert Lehnen and Associate Director Carlyn Johnson head the Indianapolis office.

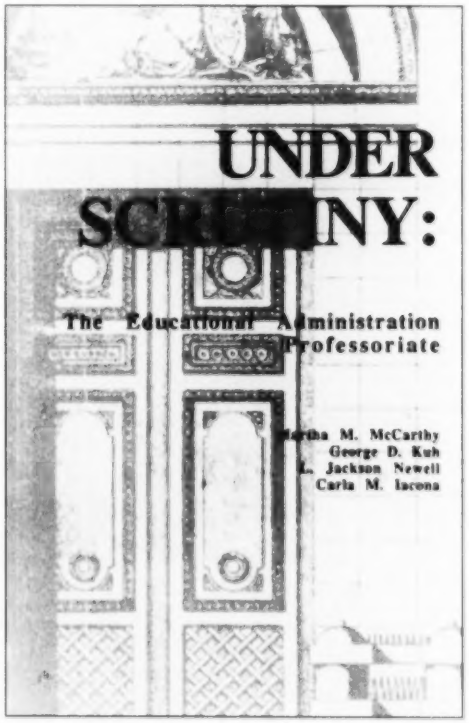
According to McCarthy, the time is right for university-based policy centers. Only four centers existed before 1986; as of July 1991, the number had grown to 23. She attributes the sudden growth to the fact that the locus of influence in education policy has shifted during the last decade from the federal to the state level. Governors have championed school improvement efforts in "an unprecedented fashion," says McCarthy. They and other state officials have been quick to initiate school reform packages. Also, because national reform reports "use the promise of greater economic productivity" to justify enhancing the quality of schooling, state legislators have "taken advantage of the political capital associated with education issues." McCarthy notes also that advantages for Indiana University include serving as an information broker—connecting the providers (the university) with consumers (policy makers and educators)—and creating a more visible role for the university in the state policy community. At present the center is guided by a 24-member advisory board of political, educational, and community leaders from all regions of Indiana, as well as a liaison committee that represents all eight Indiana University campuses. The center publishes nonpartisan research reports, policy papers, and newsletters; it maintains an Education Policy Data Archive; and it sponsors conferences, symposia, and workshops.

Although McCarthy's co-directorship of the center is technically a part-time position, she gives it much more than a part of her attention. "She's the hardest-working person I have ever met," says Mark Buechler, a doctoral candidate in the English department who is employed as a part-time research associate for the center. "She talks to the governor, to senators, to the state superintendent of public instruction to find out more about their educational policy needs and interests. She reads and edits every publication that goes out of the Bloomington office. It is unbelievable how much she accomplishes." Buechler has been asked to work full time for the center when he has completed his dissertation. He likes the fact that his work at the center can lead to published research. "It's good to research something, write about it, and put it out," he says. "It's also good to feel that you might possibly have some influence on education policy in the state."

Another doctoral candidate, Jeannette Olson, has recently begun working for the center while writing a proposal for a dissertation on legal barriers to school restructuring efforts. Olson had been an elementary school teacher before she began her doctorate; as



McCarthy examined the application of the First Amendment to public education in A Delicate Balance: Church, State, and the Schools *(1983).*



McCarthy's comprehensive study, Under Scrutiny: The Educational Administration Professoriate, *was published in 1988.*

McCarthy's graduate student she saw immediately how legal perspectives on contract negotiations, student discipline, and free speech issues could be essential information for any public school teacher. Olson has asked McCarthy to serve on her dissertation committee, convinced that her writing will get McCarthy's full attention. "She's involved in so many activities, but she's still accessible. That's inspiring to someone like me, as I will probably work in the academic world myself."

"When I was at Indiana, I searched for four years for her secret," says John Dayton, who studied under McCarthy and is now an assistant professor of education law and politics at the University of Georgia. "There is no secret, really. I think it is just hard work." Dayton states that he wouldn't be teaching education law if it weren't for McCarthy. "I'm trying to pattern my career after her." McCarthy and Dayton are currently writing an article, "User Fees in Public Schools: Are they Legal?," in which they question the authority of public schools to charge students for transportation, books, and various school activities. This publication continues a research partnership that McCarthy encouraged when Dayton was a graduate student.

McCarthy continually draws on her research and her applied work for the center to examine ways in which legal decisions affect the quality of public education, the successes of high school graduates, and, ultimately, the level of education of our citizenry. Is there, for example, a law in Indiana that defines an adequate education? "Our language is vague when we talk about legislative responsibility," McCarthy admits. "The law says we must provide for a uniform, free system of public schooling, but it doesn't go into detail in describing what this means."

We've got to stand behind what we say. If we say that students have certain skills, then they should have them. We have to make sure their schooling means something, that their diplomas represent significant achievement.

All public schools in Indiana are required to provide each student at least five hours of instruction time in grades 1 through 6, and six hours of instructional time in grades 7 through 12 each day of the minimum school year. From 1972 to 1988, Indiana had one of the shortest school years in the country; the state-required minimum number of school days was 175. Since 1988 this number of days has been lengthened to 180, keeping Indiana in line with most other states. Further, a state mandate requires that a specific number of minutes of reading, writing, and math be taught each day. This requirement has brought forth complaints from teachers who feel that rulings of this sort are cumbersome and restrictive. How can a designated number of minutes of specialized instruction ensure an adequate education? A 1991 Policy Center special report, *Constraints on Teachers' Classroom Effectiveness*, examines these and other mandates in detail.

Instead of debating over how many minutes of a given subject should be taught each day, policy makers recently have shifted their attention to the results of public school instruction, says McCarthy. "Legislators aren't counting the books or the square feet in the library. They are concerned with assessment: How are the students doing? This determines whether the program has been adequate or not. There's a lot of attention right now, for example, on moving away from standardized tests and moving towards portfolio arrangements and other kinds of assessment strategies that will let us know that students have grasped what it is we want them to do."

McCarthy is quick to state that while we must have some way of measuring how students perform, the legislation of such a measure must not jeopardize the rights of the individual student. Starting in 1988 in Indiana, students in grades 1, 2, 3, 6, 8, 9, and 11 began taking the ISTEP test, a statewide assessment of achievement in reading, language arts, and mathematics. The test also included a writing exercise. In 1989 ISTEP was expanded to include science and social studies. Students who scored below the state achievement standard were required to attend special summer remediation classes. Responding to criticism that too few students were being identified for summer assistance, the General Assembly raised the cut-off scores for the 1990 ISTEP. As a result, the remediation rate climbed to 6.8 percent—23,647 students.

Curricular requirements for graduation from high school have increased as well, as have expectations of student performance. This stricter legislation on the secondary level has resulted in increased enrollment in academic subjects, a beneficial outcome. Yet there are disturbing statistics in the assessment of overall high school achievement. Almost one-fourth of the students who enter the ninth grade in Indiana public schools do not graduate four years later. In the 1988-89 academic year the graduation rate declined to 75.4 percent, the lowest point of the decade.

The censorship issue has important implications for educators, McCarthy says. We are being challenged by these conservative groups, and we can't expect the courts to protect our liberties, as they did in the late sixties and seventies. "Now that courts are deferring more to the authority of school boards to make decisions, educators need to become more assertive. They need to take a stand, defending their texts as educationally sound."

human interests and ideals, the current term, secular humanism, McCarthy notes, "bears little resemblance to dictionary definitions." Coined by the Moral Majority, secular humanism adds heat to the debate of humanism against Christianity. Those attacking secular humanism, most notably the New Christian Right (NCR), represent, according to McCarthy, "conservative groups, primarily fundamentalist or evangelical Protestant in orientation, that emerged in the 1970s and coalesced with the political right." Among the well-known groups that make up the NCR are Jerry Falwell's Liberty Federation, Phyllis Schlafly's Eagle Forum, Pat Robertson's National Legal Foundation, and Tim LaHaye's American Coalition for Traditional Values. NCR attacks on mainstream education have received much publicity in recent years. McCarthy notes as an example Tim LaHaye's assertion that secular humanists have infiltrated and taken control of the schools, resulting in a school curriculum that is "anti-God, anti-moral, anti-family, anti-free enterprise, and anti-American."

McCarthy is investigating the strategies of censorship employed by the religious right and the impact of such activity on public school curricula. "In the censorship arena," she says, "we have seen more reluctance on the part of the federal courts to intervene and substitute its judgment for that of the local school board. As long as the decisions are for pedagogical reasons—as long as they are educationally based—the elected school board can make those decisions. That is fine if the board is committed to the robust exchange of ideas in public schools. But if the board is not committed to that and wants to restrict what is said in our public schools for religious or other reasons, then it becomes more troublesome. Conservative parent groups have had increasing success in influencing school board elections. There are about 200 organizations of conservative parent groups that are involved in curriculum controversies." McCarthy is taking a close look at these conservative groups, reading publications such as *Secular Humanism: The Most Dangerous Religion in America* and *Ravaged by the New Age*. She has been making lists of books that have been questioned in court; included are *Slaughterhouse Five* by Kurt Vonnegut, Jr., *Laughing Boy* by Oliver LaFarge, *Soul on Ice* by Eldridge Cleaver, and *The Naked Ape* by Desmond Morris. The censorship issue has important implications for educators, she says. We are being challenged by these conservative groups, and we can't expect the courts to protect our liberties, as they did in the late sixties and seventies. "Now that courts are deferring more to the authority of school boards to make decisions, educators need to become more assertive. They need to take a stand, defending their texts as educationally sound."

Educators also need to have their procedures in place, McCarthy warns, so that when censorship issues flare up the school has a committee ready to discuss the problem with parent groups and make recommendations. "When parents are storming the principal's office," she says, "shouting 'take this book out!'—then it's too late."

—Nancy Cassell McEntire

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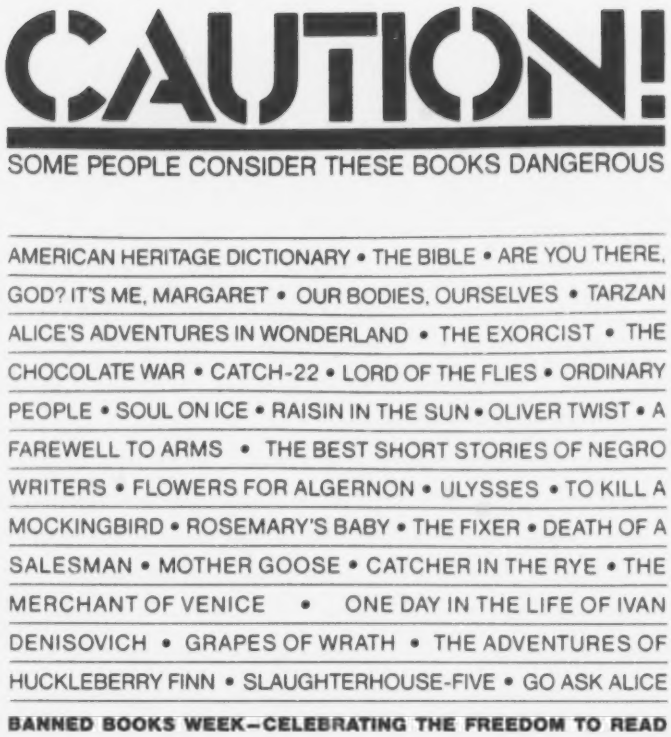
CAUTION!
SOME PEOPLE CONSIDER THESE BOOKS DANGEROUS
AMERICAN HERITAGE DICTIONARY • THE BIBLE • ARE YOU THERE, GOD? IT'S ME, MARGARET • OUR BODIES, OURSELVES • TARZAN ALICE'S ADVENTURES IN WONDERLAND • THE EXORCIST • THE CHOCOLATE WAR • CATCH-22 • LORD OF THE FLIES • ORDINARY PEOPLE • SOUL ON ICE • RAISIN IN THE SUN • OLIVER TWIST • A FAREWELL TO ARMS • THE BEST SHORT STORIES OF NEGRO WRITERS • FLOWERS FOR ALGERNON • ULYSSES • TO KILL A MOCKINGBIRD • ROSEMARY'S BABY • THE FIXER • DEATH OF A SALESMAN • MOTHER GOOSE • CATCHER IN THE RYE • THE MERCHANT OF VENICE • ONE DAY IN THE LIFE OF IVAN DENISOVICH • GRAPES OF WRATH • THE ADVENTURES OF HUCKLEBERRY FINN • SLAUGHTERHOUSE-FIVE • GO ASK ALICE
BANNED BOOKS WEEK—CELEBRATING THE FREEDOM TO READ

Do increased requirements or mandatory examinations result in a more effective educational program? In her newly revised book, *Public School Law*, McCarthy points out that although the state's authority to assess student proficiency has not been questioned, the implementation of specific minimum competency testing has been. "The proficiency movement just swept across the country," she says, "often as a prerequisite for receiving a diploma. The state has a legal right to establish academic standards for students, including mandatory examinations, as long as their requirements are not arbitrary." She adds that recent litigation over this controversial national phenomenon has centered around such vulnerable areas as sufficiency of notice, racial impact, adequacy of preparation, participation of handicapped pupils, and remedial opportunities. The Fifth Circuit Court of Appeals, for example, found that 13 months from the time a statewide proficiency testing requirement was adopted until it was used as a graduation requirement, was insufficient notice for students to prepare for the test.

McCarthy notes that the judiciary traditionally has been reluctant to interfere with scholastic assessments of student performance, leaving such evaluation to professional educators. In 1985, when the United States Supreme Court rejected a claim that an academic dismissal from medical school violated a student's constitutional rights, they did so out of respect for the faculty's professional judgment.

One learning-related topic that has generated litigation since the mid-1970s is instructional negligence: Parents have asserted a right to expect their children to be functionally literate upon graduation from high school. In a highly publicized case in California (*Peter W. v. San Francisco Unified School Board*), a student claimed that the school district was negligent by graduating him from high school with the ability to read only at the fifth-grade level. Both the trial court and the California appeals court dismissed the charges. "We haven't had a successful educational malpractice suit yet," McCarthy points out. "I don't think we are going to have a successful 'Johnny-can't-read case,' where the child goes through school, is tested at graduation, and claims that he can't read. Whose fault is this? The third grade, the fifth grade, the first grade teacher? In the California litigation, the parents' case would have been stronger if they had emphasized the school's duty to report to parents. Had they been told all the way through his schooling that he had been doing fine? That's something that I can respond to as an educator. I feel that we should report all progress accurately. We should be held accountable for doing that. If we promote students who don't perform well after we have attested that they can, then we're building grounds for a successful lawsuit."

McCarthy is investigating the strategies of censorship employed by the religious right and the impact of such activity on public school curricula.

Incidents like the one in California put pressure on educators to teach effectively and responsibly, she says. "We've got to stand behind what we say. If we say that students have certain skills, then they should have them. We have to make sure their schooling means something, that their diplomas represent significant achievement."

McCarthy's recent research has led her into the murky world of secular humanism. Responding to allegations that public schools are unconstitutionally promoting secular humanism, McCarthy is analyzing the legal parameters of a crisis of values in public education. While the word humanism traditionally refers to modes of thought centering on distinctly

Worldwide Literacy: It's a Matter of Time

Harbans Bhola, Professor of Education, Indiana University Bloomington

International Literacy Year logo, designed for UNESCO by Japanese graphic artist Kohichi Imakita. The logo represents humanity reading, a stylized person holding a book, surrounded by laurels symbolizing the United Nations.

Imagine not being able to read the sign that warns you away from the high-voltage fence, or the label that tells you the white powder is pesticide, not sugar. Imagine obligating yourself to a contract you cannot read. Imagine living in the modern world without the ability to decode the written word.

For those of us who make our way through life in the high-literacy environs of universities and libraries, such limitations are all but impossible to imagine. But for most of the world's people throughout history, illiteracy has been the norm, oral culture dominant. In our time, though, things have changed. "No human institution today is premised on orality," observes Harbans Bhola, Professor of Education at Indiana University Bloomington. "Everyone is enveloped in a culture of print. Everyone needs literacy to survive in relation to the literate spouse, the literate money lender, the literate agents of the church, the government, and business."

Bhola's quarter century of work with international efforts to expand literacy has brought him to his current interest in developing an "essential theory of literacy" based on the premise that literacy is no longer a luxury reserved to the relative few but a fundamental skill for survival. Nor is he speaking of survival in a purely physical sense. As Bhola wrote for a UNESCO publication connected to International Literacy Year, 1990, "Survival is interpreted in normative terms—it is not mere existence but a life of acceptable quality. It is more than mere survival—a matter of a steady pulse and a regular heartbeat. It is more than mere survival—a life supported with barely enough to keep body and soul together but denied political freedom, economic fairness, social acceptance, and personal fulfillment. The practice of the normative ideal of survival is, thus, impossible solely in terms of the biological and the concrete. Its actualization requires the cultural and the symbolic." Bhola sees the modern role of literacy as analogous to other great leaps in the development of the species and its cultures. "Literacy today has the same salience in homo sapiens' journey as speech had a few million years ago. We're now at a stage where everyone must become literate—not doing so will be like not having legs."

This is not to say, of course, that no one will survive without the ability to read and write. "It's like being well-fed. We know that something can be essential but still absent. But in the next 50 years, if not sooner, the need for being able to handle marks—directions, warnings, numbers—will have become the norm." Modern technology and transportation have changed global culture so profoundly that there is no oral culture in the sense that oral culture was defined in the past—where there is no contact with the written word. "It is a clear, convincing and compelling truth that both culture and technology are today premised on universal literacy. The concept of preliterate or oral cultures has become empty of real meaning, no more than a scholarly category in theoretical discussions. There is no society in the world today that is fully functioning as an oral culture and in which the illiterate are not, more or less, disadvantaged." Bhola bases his assessment of writing's preeminence on his encounters with writing in even

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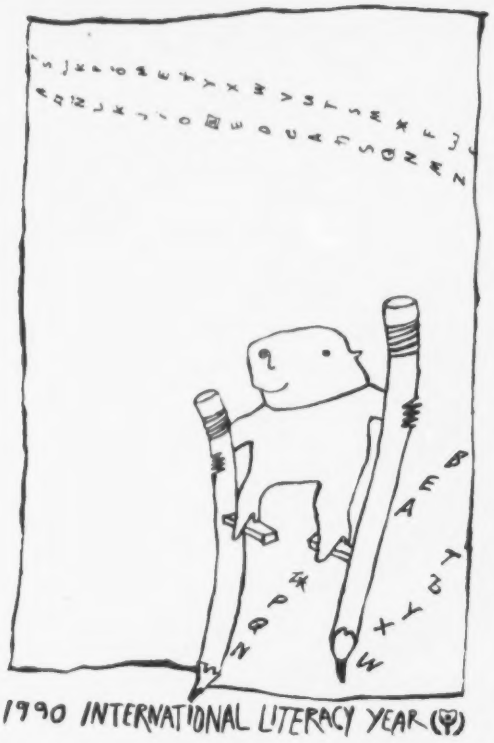

The official 1990 International Literacy Year poster, designed for UNESCO by Canadian Zabelle Cote. With her drawing, Cote wished to convey the message that "the ability to read and write gives people a new perspective on life and the world around them."

the most unexpected and remote corners of the globe. "I have seen it among Bushmen in the Kalahari—Coke cans, beer cans, the Bible, even school books in some parts."

Bhola's scholarly interest in developing the essential theory of literacy is complemented in very practical terms by the book he is writing for UNESCO, Paris. His goal is to produce a guidebook that is general enough to serve the interests of literacy workers around the world. "A tall order," Bhola laughs, "but somebody has to do it!" If UNESCO approves the final version of the book, titled *Literacy Work at the Grassroots: A Practical Guide to Functional Literacy*, it may be published in as many as 20 languages and will provide literacy workers with proven approaches and techniques for extending literacy to broader portions of populations.

The push for greater worldwide literacy has, according to Bhola, been one of the success stories of the international development effort, though not an unmitigated one. "In the 35 years between 1950 and 1985, the rate of illiteracy in the adult population has declined from an estimated 44.5 percent to 27.7 percent—and this despite unprecedented population growth," Bhola wrote in 1990. As might be expected, the vast majority—98 percent—of the world's illiterates live in the Third World, and women fare worse than men in developed as well as developing countries. Globally, 34.9 percent of women as opposed to 20.5 percent of men over the age of 15 are unable to read and write. But in the least-developed nations, the illiteracy rates are 56.9 percent of men and a staggering 78.4 percent of women. Other discrepancies also exist. As Bhola commented in a recent article, "There are . . . serious disparities in literacy acquisition by urban and rural locations, and by age cohorts. Rural illiteracy ratios may often be five times the illiteracy ratios in urban areas of the Third World. Illiteracy ratios increase as we go up the age ladder." Nevertheless, he is optimistic about the future of literacy. "The numbers of illiterates, in both absolute and proportional terms, are down according to the latest UNESCO figures."

But there is more to the story than mere numbers. "The greatest victory is that literacy has stayed on the agenda; it hasn't gone away. The promise that electronic media would do away with the need to read has been an empty promise. It has become evident that there is no substitute for literacy. In some communities electronics are simply beyond reach—the cost of two dry-cell batteries may equal half the monthly salary of a person supporting a family."

Economics bear on literacy in other ways as well, ways that, sadly, aren't always measured by the statisticians. "People are looking for successes in the formal economy. But the real victories are in the informal economy, with the subsistence farmers and others who operate essentially outside the formal economic structure." Thus the formal picture based on statistics is incomplete and

Sowing the seeds of development: International Literacy Day, September 8, 1972. From UNESCO Through its Posters, *p. 12; © UNESCO 1989. Reproduced by permission of UNESCO.*

potentially misleading. Bhola points out, for instance, changes in countries such as Tanzania, where he worked from 1968 to 1970, assisting the UNESCO/UNDP Work-oriented Adult Literacy Pilot Project in the Lake Regions of the United Republic of Tanzania. Although the per capita income has fallen over the past several years, the mortality rates, particularly of infants and women, have also fallen. Certainly part of the credit must go to immunization programs and other such concrete development efforts, but literacy also plays a critical role in such improvements as it gives people the information they need to become proactive in bettering their own living conditions.

Bhola stresses that better lives for people in many developing areas, including lower sickness and mortality rates, are due in large part to increased literacy. That relationship is evident to those who benefit from learning to read; "Once people see the benefits of literacy, most support educational initiatives." Unfortunately, there are those who fail to recognize the fundamental connection between literacy and development. "But we know that in social change there are no firsts and seconds. Literacy must be made to play a dialectical

role in enhancing all development. The critics say that the environment of the nonliterate does not offer opportunities for the use of literacy. But literate environments do not rain from the sky, they must be created by helping people put their newly acquired literacy skills to work."

Political and sociocultural arguments are also used against expanded literacy programs. "They tell us that the nonliterate are doing quite well without 'impositions' from the outsider. Of course, the nonliterate 'survive.' They are born. They grow up. They play. They sing. They marry. They buy and sell. They build huts and homes. They make beautiful artifacts. They have children and grandchildren. They develop deep understandings of life. Some lead and govern their peoples in localities and communities. But it is impossible to deny that at this point in human history, they are clearly and unquestionably disadvantaged in relation to the other two and a half thousand million adults who can read and write and, therefore, have available to them the world of print from which the nonliterate are excluded. The illiterate are excluded and marginalized, as they are prevented from joining in to define their own world and from contributing to collective knowledge, to history, and to culture." The benefits of literacy for most members of society are the very factors that have caused a few people to take action against literacy programs, sometimes violently. Seen by various factions as a threat to the status quo, USAID literacy workers were killed in the early 1960s in Cuba, Nicaragua, Ecuador, and elsewhere. In other cases, recalls Bhola, protests were less violent but no less passionate.

In India in the late 1960s and early 1970s, for example, the money lenders demonstrated against teachers at Literacy House in Lucknow, where Bhola served as a program director from 1966 to 1968. "Their highly exploitative hold on poor farmers was being threatened—imagine if the farmers could read the terms of the contracts they signed!" Since a major part of the literacy movement involved educating women and girls, whose training had in many cases been confined to traditional homemaking skills, the protesters focused their arguments on the dangers of changing. "They argued that the literacy classes kept women from their work, that reading was worthless for women. They also argued that taking women out of their homes and gathering them in groups was teaching them bad manners and bad morals." In the end, though, enough people realized the benefits of widespread literacy, the programs prevailed, and a move toward equity in literacy between the sexes progressed.

Women's literacy class at Legbassito, Togo, West Africa; from Literacy for Rural Women in the Third World, *p. 66. © UNESCO 1990. Reproduced by permission of UNESCO.*

Indeed, rather than being bound by culture, people learned historically and are still learning through writing to control and change the institutions that affect them. The money lenders of Lucknow were correct about the danger of bringing together people who are dissatisfied with their lot in life and teaching them to read. "Literacy, even when taught by the most conservative, brings the reader in touch with modern, scientific, nontraditional knowledge which is available primarily in print," observes Bhola. "There is a connection between literacy and solidarity. Literacy is often taught in groups. Coming together in groups gives learners a sense of solidarity and the capacity for transfer of organizational skills learned in class to other community settings. With the invention of writing, men and women rewrote their life scripts. They reinvented themselves. They were able to have history, and to re-create culture." They continue to do so today as literacy encompasses more people in more places.

Even now, though, Bhola has found that lack of literacy affects women more than men in many places, because, in more traditional societies, boys tend to have more access to the formal educational system than do girls. But in some places there is recognition that a literate woman makes a better mother and wife, and she improves the standard of a family's living through her access to information about everything from childcare and safe food storage to birth control and personal hygiene. The combined effect of reduced access to schools and increased awareness

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Literacy opens up the wonderful world of reading. Says Bhola, "When you can read you are like the legendary thief who comes upon a castle full of diamonds."

of the benefits of reading is that "there tend to be more women than men in literacy classes in many places, as I have seen in sub-Saharan Africa," says Bhola. Such changes in attitudes make it clear that literacy has indeed become an essential part of societies worldwide.

The centrality of literacy is the focus of Bhola's essential theory of literacy, wherein he looks not only at the quantifiable aspects of the international literacy movement, but also at the profound effects that learning to read and write has on individuals and societies. "The ability to symbolically reconstruct reality in two dimensions—speech and writing—is powerful. People learn by that ability to reconstruct themselves."

Because the effects of literacy are so profound and far-reaching, Bhola has integrated the social psychological theory of literacy with psychological and political theory in the essential theory. Indeed, he says, "all the theories from different disciplines converge in literacy." Furthermore, it is the knowledge of being able to learn that empowers people; explains Bhola, "Metalearning is more important than learning—knowing that the knowledge is there leads you to the learning itself."

That knowing leads also to changes in aspirations and requirements, and extends the physical environment beyond a person's traditional horizons. And while the changes are often seen in grandiose terms, Bhola notes that sometimes it is in the realm of basic, mundane behaviors that the newly gained power is most significant. "In Zimbabwe, I've seen people with even the most rudimentary literacy skills suddenly acquire essential power—they are able to go to the city, to find their way around, to find the right restrooms! Everything changes, their relationships to family, community, and the larger world all change. If nothing else literacy spreads discontent, and the literate are more amenable to political organization than are the nonliterate. A person who learns to read has a new identity and a new potential to interact with the environment. You can even dig ditches better!"

Direct access to the written word also enhances a person's and therefore a community's economic potential. "Literacy has made 'scientific' agriculture possible in the little kitchen garden and has made 'scientific' poultry farming possible in old tin bath tubs. Subsistence farmers have been able to make better use of the extension services of the government, and they have done well at the weighing machine as they have sold their produce to the cooperative. They have been able to read and sign receipts, invoices, and checks for the right amounts. The newly literate farmers have learned entrepreneurship and management skills, and thereby risen above mere subsistence levels. But without literacy it is impossible to survive in relation to today's economic institutions, which lend and borrow, buy and sell, and require that all, literate and illiterate, sign contracts with them."

The essential power of literacy, Bhola points out, lies not in the reading itself, though that can of course be a pleasurable pursuit. But the words we read convey meaning. "You don't just read, you read something, so you acquire knowledge for making better

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The push for greater worldwide literacy has, according to Bhola, been one of the success stories of the international development effort.

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transactions with the physical, social, political, economic, even the spiritual environments."

One of the problems in discussing literacy, for both scholarly and practical purposes, is the problem of defining literacy itself and ensuring that when people discuss literacy they are in fact discussing the same thing. *The Compendium of Statistics on Literacy*, published in 1988 by UNESCO, defines a "literate" person as one "who can with understanding both read and write a short simple statement on his everyday life." A "functionally literate" person "can engage in all those activities in which literacy is required for effective functioning of his group and community and also for enabling him to continue to use reading, writing and calculation for his own and the community's development." While Bhola sees both the UNESCO definitions as "workable," he notes that they do not solve the problem of defining literacy. He finds it more constructive to view different types of literacy as ranges on a continuum running from highly sophisticated "scribal" skills at one end to "rudimentary" skills at the other. "There will always be people who are highly literate, who have scribal literacy—these are the elite literates we find at universities and other such places. There will also be people who, though classified as 'literate,' possess only the most basic of skills. And most people will remain somewhere in between because they have never been pushed to higher levels, or because they remain unconvinced about the value of better skills. It is impossible to make everyone a scribe, and it's also quite unnecessary. Our hope is to raise the floor of differentiation, to increase the level of skills at the bottom of the range."

As more and more people become literate, and as literacy becomes more and more important beyond basic survival, the skills that are needed are sure to become increasingly sophisticated. But even at its most fundamental level, literacy is more than a tool for doing a job. It is a key to riches beyond imagination. After 25 years of work aimed at increasing literacy around the world, Harbans Bhola neatly sums up that essential value of being literate: "When you can read you are like the legendary thief who comes upon a castle full of diamonds."

—Sheila K. Webster

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The Gift of Language

Richard T. Miyamoto, M.D., F.A.C.S., Chairman and Arilla DeVault Professor, Department of Otolaryngology-Head and Neck Surgery, Indiana University School of Medicine

The study of the deaf," Oliver Sacks writes in *Seeing Voices*, "shows us that much of what is distinctively human in us—our capacities for language, for thought, for communication, and culture—do not develop automatically in us, are not just biological functions, but are, equally, social and historical in origin; that they are a gift—the most wonderful of gifts—from one generation to another." Sacks, whose earlier book *Awakenings* was recently filmed by Penny Marshall, points out that it is the deaf—especially those who are born deaf—who lie at greatest risk of losing, or of attaining only incompletely the gift of language.

Though the deaf in our country have developed their own visual language—American Sign Language—only a small percentage of the deaf are born to deaf parents and taught Sign as a native language. The rest struggle to survive in the hearing world and to acquire language in much the same way as hearing people do; yet, for the profoundly deaf, without the ability to absorb the sounds of the language around them, that task is made much more difficult.

Sacks defines the "profoundly deaf" as those people "who have no hope at all of hearing any speech, whatever imaginable technological advances are made." Though written just five years ago, this statement is already dated; indeed, it was incorrect even when Sacks wrote it. A device called the cochlear implant has, in fact, made it possible for the profoundly deaf—even those who are not helped by the most powerful hearing aids—to hear speech like never before.

Richard T. Miyamoto, M.D., F.A.C.S., is the Chairman and Arilla DeVault Professor of the Department of Otolaryngology-Head and Neck Surgery at the Indiana University School of Medicine; as the Director of the Indiana University Cochlear Implant Project, he and the other members of that team have been at the forefront of this developing medical technology for the last decade. With a growing emphasis on cochlear implants for children, Miyamoto and his team are attempting to make it easier for deaf children to function as part of the hearing world.

"From the beginning of time," Miyamoto says, "no medical treatment had been available for deaf people. Here at the James Whitcomb Riley Hospital for Children, we would peek at their ear and send them off to the deaf school, because the medical profession had nothing to offer. Now, finally, there is a medical way to help some of these people."

A hearing ear is an extraordinarily complicated piece of biological equipment. Ordinarily, when we hear something, the sound is first gathered by the outer ear—the visible portion—which acts as a kind of antenna, receiving and directing the sound into the ear canal. The sound travels down this canal and strikes the eardrum, which in turn moves a chain of three tiny bones—the malleus, incus, and stapes—that carry the sound waves to the cochlea. The movement of the stapes sets the fluid within the snail-shaped cochlea into motion. Situated around the inside of the cochlea are about 30,000 hair cells, which are bent by the motion of the fluid; these nerve cells transduce the mechanical vibrations into electrical signals, which are directed up the auditory nerve. These electrical signals are then sensed as sound by the brain.

The cochlear implant bypasses this complex chain of events and sends an electrical signal directly to the auditory nerve itself. In some senses, the implant works much like a human ear. An external microphone picks up sound and carries it to an external processing unit, which converts the sound into electrical signals. These signals are then sent to an internal receiving unit, which has been surgically implanted in the inner ear; and, as the hair cells of the cochlea would do in a hearing ear, this unit stimulates the auditory nerve.

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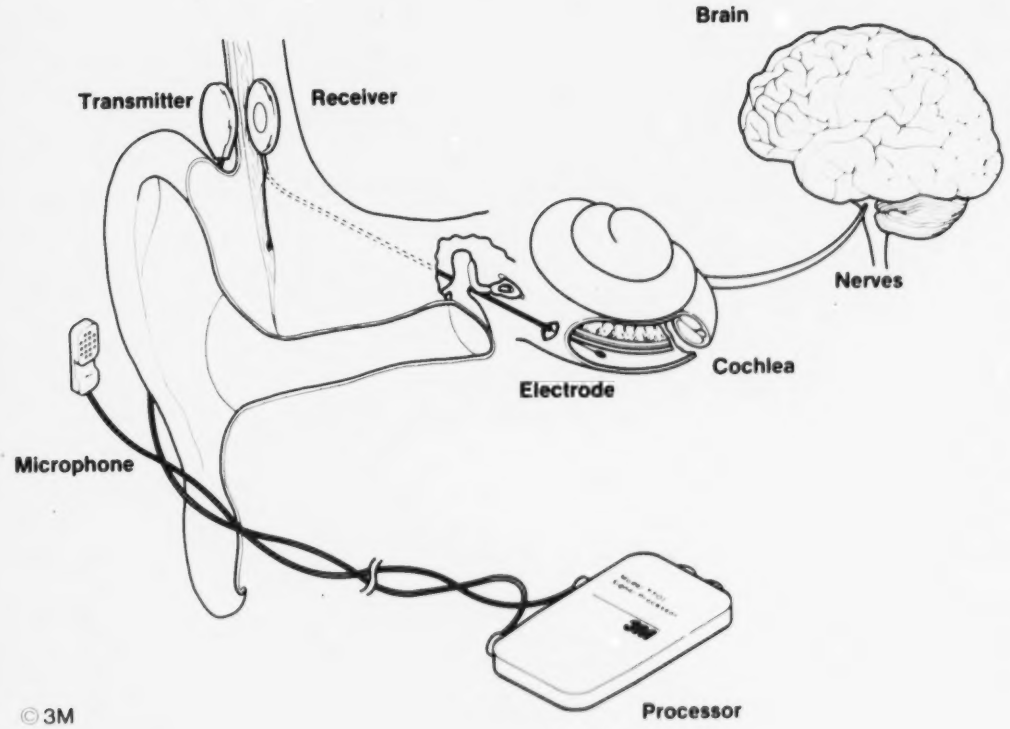


Drawing of the first cochlear implant. The device in use today has multiple electrodes, unlike the single electrode shown here.

One of the great advantages of the implant's design is that it works regardless of the original cause of deafness. The only requirement is that the patient have a functioning auditory nerve, which is present in all but about 10 percent of the hearing impaired.

"The idea of electrically stimulating the ear is not a new one," Miyamoto says. "Two hundred years ago or thereabouts, Volta, when he invented the electric battery, put little metal rods in his ears and stimulated them. He was able to develop a sound like that of sizzling soup. So it's been known for a long time that you could electrically stimulate the ears and create a sensation of sound, but that remained just an observation. To most it seemed rather silly for Volta to have done that. The idea lay dormant until the 1950s, when some French researchers began to devise experiments to stimulate the auditory nerve."

Even then, however, the idea met with great resistance from the medical and scientific community. One of the pioneers of the cochlear implant in this country is William House, with whom Miyamoto worked while on fellowship following his residency. The first cochlear implant they used was a single channel device that had been developed by House and engineer Jack Urban. With just one electrode—much simpler, of course, than the ear itself—the device could only transmit timing and loudness information; users could tell from the signal only when sounds started and stopped, along with the relative volume of the sound. Miyamoto recalls, "Scientists looked at this and said, 'Well, you've got one of the most complex organs in the body, with 30,000 nerve fibers, and you're going to put one little wire in there and have it mean anything?' They thought it was ludicrous to think that anything good was going to happen. But people were getting a sensation of sound. Bill House had implanted some patients and they said that even though it wasn't normal hearing, they were getting loudness and timing information almost in a normal manner. Environmental sounds were coming through and they were back in contact with their surroundings. The cochlear implant also helped their lip-reading. Even though the scientists, speaking theoretically, were saying there was nothing there, patients were saying, 'Listen, my life has changed.' The difficult issue was that Bill House was unable to get anyone who had the requisite scientific knowledge that might push this project forward to look at it with any interest. So, amidst a tremendous amount of criticism, he opened a national clinical trial. He said, 'Well, we'll get some patients out there and maybe they'll start listening to them.' "

In 1979, Miyamoto, having just joined the faculty at the Indiana University School of Medicine, was chosen to join others across the country in this original clinical trial of the cochlear implant device. The clinical orientation fit well with Miyamoto's medical outlook, he says: "I was basically interested in clinical medicine, and Indiana University is a very strong clinical program. Most of the important advances in otology have come out of this clinical arena, from clinicians who have asked a pressing clinical

question. Often it takes some basic scientists to help develop the ideas, but most of the key questions—particularly in ear surgery—came from practitioners who were faced with patients with problems, and who were forced to come up with better solutions. I wanted to be part of that process. I never intended to spend my career in a basic science lab away from patient contact. This was a project that was very much patient-driven, and I felt like it fit into a busy practice, and it turned out to do just that."

Indeed, it was the experience of the patients that provided the impetus for the continuation of the project. "Like so many other ideas, if you looked at the odds against it, you would think it just wasn't going to work," Miyamoto says. "But I had had contact with enough patients who said, 'Gee, you've got to keep going.' "

Along with the treatment of the patients themselves, much of Miyamoto's time during these early years was spent overcoming the initial resistance to the idea, and convincing others that cochlear implants are a viable aid for deafness. This was the first implantable device monitored by the Food and Drug Administration, so Miyamoto was often in Washington, D.C., presenting the results of the research project. The focus at first was to demonstrate the safety and efficacy of the cochlear implant, both of which have now been illustrated to the FDA's satisfaction; due to the success of the clinical trials, cochlear implants were first approved for general use in adult patients, and in June 1990 were also approved for use in children two years and older.

With the FDA approval, Miyamoto also finds that the focus of the research has shifted slightly: "The thing that's different now is that we're past all these initial concerns about safety, and we've got patients who are succeeding with the implants, so it's no longer a question of whether we should be doing it, but a question of how far we can go with it. And that's a very different place to be."

One major advance so far has been the development of the technology of the implant device itself. Whereas the first models were single-channel, the one researchers are using now has 22 channels, Miyamoto explains. "The way the inner ear codes high and low signals is by stimulating different places in the cochlea. So with the multi-channel device, we can stimulate the base of the cochlea, or the apex, or a number of places in between." In this way, patients can hear the pitch of sounds as well.

This multi-channel device has proven so successful that several deaf adults can now talk on the telephone with its assistance. When Miyamoto was helping to teach a course in Denver, he took with him the first adult patient who had been fitted with a multi-channel implant at IU. "The first thing he did when he arrived," Miyamoto remembers, "he picked up the phone, called home, and let everyone at home know that he got there safely. He didn't travel out of town much, so it was a big event for him. I thought, well, those are familiar listeners, and they know his voice, and he knows their voices. But then, he turned to the Yellow Pages and called three car rental agencies to check on prices. He came out just as pleased as he could be because he had found the best price. Now, I know that these car rental agencies at the Denver airport didn't have people trained in case a deaf man called, but nonetheless he was able to carry on phone conversations with these rental agents."

Yet not everyone has reached this level of facility with the implants. Miyamoto has found that the least successful users of the cochlear implants are adults who have been deaf from birth. In contrast, the best patients have been postlingually deaf adults—those who grew up as hearing people and developed speech and hearing concepts before becoming deaf. What this suggests, says Miyamoto, is that "what happens within the brain is the real success story of the cochlear implant." Those adults who had learned to understand language prior to the onset of their deafness had already developed the neurological capabilities to process sound into understandable speech. Adults who have never known aural language do not seem to be able to develop this skill. "There is probably some point," he surmises, "if you've never learned to speak, and auditory information isn't part of your upbringing, at which your central nervous system no longer has a very good ability to use sound."

The important role the brain plays in hearing also helps to explain the experience of new users of the cochlear implants, says Miyamoto. "When we first hook these implants up, we've had patients who just perceive a lot of noise. The first couple of times, when people have been deaf for many, many years, you turn it on and it sounds like a bunch of static; it isn't really sound at all to them. They'll say, 'I gave up 20 years of deafness for this?' But then they come back six months later and the implant's signals have started sounding like sounds. Well, the little device is doing the same thing it's always done, so what is happening is that the patients are attaching new meaning to these signals. There's a lot of central learning that goes on with this; there's not any question."

These results further suggest to Miyamoto that "as far as influencing language and learning, the children are obviously the real

The Xomed Audiant™ Bone Conductor™ hearing device, which has been cleared for marketing by the U.S. Food and Drug Administration, consists of two parts. A tiny rare-earth magnet (bottom) is implanted in the skull behind the ear. A miniature external sound processor (top) is held magnetically to the implanted disk behind the ear. It transforms external sound into imperceptible vibrations. The vibrations travel through the bone, bypassing defective or missing sections of the outer and middle ear and stimulate nerves in the inner ear (cochlea), helping the individual hear clearly. The location of the ear-level microphone results in natural sound reception. The new device helps restore clear hearing to patients with moderate to severe conductive hearing loss, combined with good nerve function in at least one ear.
—Office of Public and Media Relations, Indiana University Medical Center

Miniature ear-level hearing device.

target population. And if you're going to work with children, it's probably best to implant them early. Your brain is capable of adapting much more quickly when you're very young than when you get older. We still think we're learning as adults, so it doesn't stop, but with the tremendous amount of information that infants one, two, and three years old assimilate in nearly no time, there obviously is a rapid growth period; after that, the growth slows down a little bit. So if we can catch kids while they're on that upswing, it's probably going to start showing up in better performance down the line."

With children, too, the researchers are finding a delayed response to the device. "In the really tiny children we didn't see much for even up to 12 months. When you think about how hearing children learn to hear, you realize that they're storing up sounds probably from their prenatal days, because sounds are occurring even in that environment. They're just kind of storing them up. When you see hearing children learn to speak, too, they don't say a whole lot at first. Initially, they babble; by the time they're a year, some sounds come out; but by the time they're two, you can't shut them up. I think that's what is happening to these deaf children who have never heard. The implant is there processing sound for them, but they haven't learned to attach meaning to the sound, so it takes a while for things to start happening. We've had several children who we've implanted at very young ages; their curves have just been flat on hearing tests for quite some time, but after about a year their scores just took off."

At this point, the youngest children on whom they will perform the implant procedure are age two. Surprisingly, this decision has little to do with biological considerations. "The inner ear is adult size when you are born," Miyamoto says, "so actually we put the electrodes in the adult configuration. The head grows around it, but the target organ is already fully developed." The reason for the age requirement is instead due to the rigors of the selection and training process. "Part of it is that they have to be developed enough to let you know that they can't benefit from a hearing aid. The profoundly deaf kids with almost no hearing are relatively rare; most deaf children are not totally deaf. Many, many of them will have some residual hearing down in the lower end of the audiogram. So this is why it's so important as a first approach to this just to see what they can do. Some of them will surprise you; even though their audiogram—looking at just their ability to hear pure-tone sounds—looks really bad, some of them do quite well with just conventional amplification." For obvious reasons, physicians would rather avoid the surgical procedure required for the implants if a hearing aid proves just as useful; recent tests conducted by Miyamoto and his colleagues indicate, in fact, that hearing aid wearers typically score better than cochlear implant patients on all measures of speech perception.

"Our primary goal at present," says Miyamoto, "is to follow our children longitudinally, to watch their development over time, and to assess their ability to perceive speech as well as produce speech." This may sound simple, but it becomes rather complex in practice, he says. "We had to factor in all the issues that surround deaf children. This is very tricky."

The researchers are trying to find the answers to myriad questions that impinge upon these two basic areas—speech perception and speech production. "These types of things bring in the whole spectrum of the human sciences," remarks Miyamoto. "We started out with a simple little operation, and all of a sudden we've got all these questions, and all these people working on them; we're linking many of them in our research studies to try to get the answers. One of the interesting aspects of the project is that it's forced a group of professionals to start working together who had never done that before. The implant requires a detailed assessment, a surgical procedure, and a rehabilitation team to train the children how to use it. Since this learning phase is such a key factor, the families and schools become a big part of that as well."

Among the members of the Indiana University Cochlear Implant Project team are Wendy A. Myres, an audiologist who coordinates the clinical project; Mary Joe Osberger, an audiologist who coordinates the research efforts; Kathy Kessler and Amy J. Robbins, speech pathologists; and Julia Renshaw and Molly L. Pope, both audiologists. "It takes a very sophisticated group of people to do what we do," says Miyamoto, "and we spent a decade putting them together here. Now, we've certainly got one of the outstanding groups in the country right here at Riley. They weren't all here when we started the project, but we've brought them in one by one so they can lend their expertise to the project."

One other direction the research may move in the future is to explore more fully the functioning of the brain in hearing and speech. Classical neurological research has always focused on brains that weren't working properly, finding, for instance, what effects arise from a lesion in a particular area of the brain, and then surmising the function of that portion of the brain from the skills that seemed to be lost. The Cochlear Implant Project presents the possibility to come at the brain from a different angle. "Never before has one of the special senses been replaced by an implantable device," says Miyamoto, "so this is a new entry. This is why the National Institutes of Health and other research groups are so interested; we now have a direct way to initiate central processes. We have a non-functional peripheral system that we can now activate, so the research implications are pretty phenomenal. The brain has always been a kind of black box; it was something that you couldn't quite get into and couldn't quite figure out what was happening there. Now there are some new avenues that are giving us a lot of information and we'll start understanding some of these processes. I think we're going to have a way to learn how the auditory system develops, and eventually what pathways light up in the brain when something happens. The next step—once you start understanding these processes—is to begin gaining the ability to influence some of these processes in a positive way. It is an exciting time, and this project is one of the ones that gives people a direct access to brain pathways. So there's a tremendous amount of research potential that is really just starting to happen."

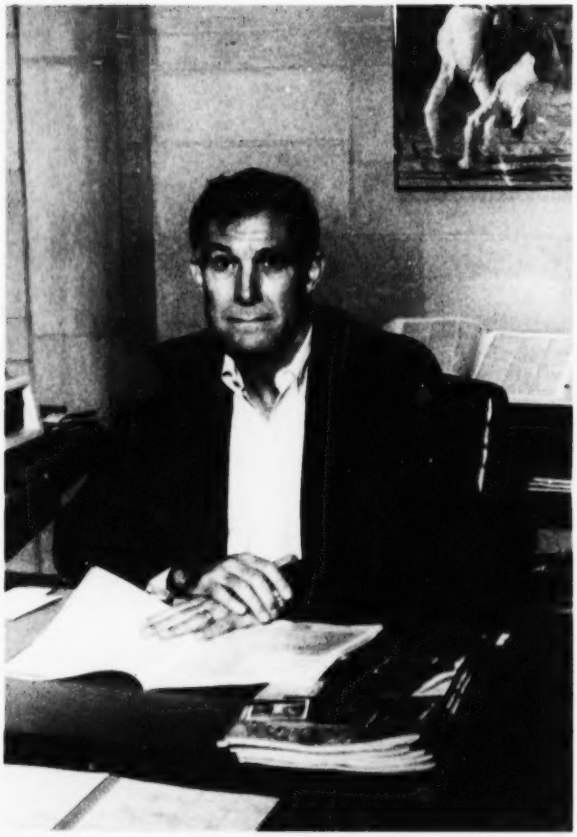
Still, despite this grand research potential, the cochlear implant remains no panacea for the difficulties of deafness. "It doesn't make the tough issues of deafness go away. They still have to be dealt with. The things that have to be done for deaf children still have to be done, but the implant gives them a much better chance to succeed. Bill House was asked 'If you had a dream for these children, what would it be?' He thought for a second and said, 'Well, I guess it would be that the children could attend their neighborhood school.' When you think about it, that's a tremendous goal, if it can be done. I don't know if this project will get the kids that far along."

Yet some of the children already have gotten that far—and further. Miyamoto tells the story of Trixie Taylor, the first child recipient of a cochlear implant at Riley Hospital: "She's a little different—she was about six when she lost her hearing from meningitis, so she had already developed speech and hearing concepts. She really doesn't hear that well with the device, if you just look at what she gets with it. But she uses everything that's available to her and really runs with it. She went to the regular school system, where the academics often start becoming very difficult for deaf children. It's not at all unusual for a deaf person to graduate from high school with about a fifth-grade reading level, because it's very difficult to develop reading skills when you're totally deaf. But Trixie went through the regular school system and was an excellent student, and she reported her grades back to us when she finished her first year at Ball State last year." Miyamoto pauses, smiling. "She got a 4.0 average. The way I put it, that's pretty good if you're not deaf. So clearly, she's succeeding in the regular academic structure. She was our first pediatric implant patient and she's really one to be proud of."

Miyamoto holds the hope that some of the deaf children who begin using the implant at an early age can match Trixie's record: "As we see these young children grow up with these very plastic nervous systems, we can't help but think that a good percentage of them will maximize their hearing and speech potential with the device. If we see even some of them attain those levels, it would be pretty spectacular." Hearkening back to Oliver Sacks's comments on language, it is clear that it would be quite a spectacular gift indeed.

—Eric A. Wolfe

Assessing Achievement



Roger Farr, Professor of Education, Indiana University Bloomington

The colorfully illustrated booklets defy all stereotypes about reading tests. Where are the rows of tiny green circles awaiting neatly placed No. 2 pencil marks? Where are the warnings about looking at your neighbor's answer sheet or being careful about time limits? And why are the students looking up from their desks to consult with one another freely, to check things in the dictionary? The children are not even answering multiple-choice questions; instead, they are reading entertaining stories and interesting articles, writing letters to story characters, creating endings for stories, and comparing facts and events in one story with those in another. The materials they are using, known as the Integrated Assessment System, have been developed by Roger Farr, professor of education and special assistant to the vice president for research at Indiana University Bloomington. These innovative reading tests are just one product of Farr's lifetime commitment to the study and improvement of reading assessment.

Assessing language development and literacy first intrigued Farr in the 1960s, when he was a high school teacher in New York state. He struggled with two issues especially—the fact that much of the high school curriculum was driven by assessment and the difficulty of finding appropriate testing procedures. "I saw that tests such as New York's Regents Exams—the exams students take if they want a New York Regent's diploma—dictated the curriculum in many high school courses, especially eleventh-grade English, which I taught," says Farr.

But the issues related to assessment seemed far more complex than just test-driven instruction. The problems of developing a test that really reflected what we want students to know and be able to do are the key issues in test development, according to Farr. "I realized that the development of a test is an 'owning-up' to what you believe," he says. "If you develop a test for a course, you have to deal with problems of defining and describing what is important. I always found that I didn't like tests because they didn't seem to get at the things that I thought were most important. For example, the things we remember years later about a book or story that have left a lasting impression on our minds are not the things that are asked on typical multiple-choice tests. We remember how we felt about certain characters, how scared the book made us feel, and what we might have done in a circumstance faced by a story character. But the typical multiple-choice, end-of-story tests ask such things as the main character's name, the color of the house, or how many people were at the party. It's not that those kinds of factual questions are unimportant; rather, the problem is that those things should not be the primary focus of literacy instruction." To test students' ability to think about the things they read has been Farr's challenge to himself throughout his career.

In the years since Farr first sensed their impact, achievement tests have proliferated. The last decade, with its growing nationwide movement toward increased assessment—spurred on by government reports such as 1983's *A Nation at Risk*—has been a frustrating period for Farr. He criticizes this movement for the form of its tests (usually multiple-choice), the importance the scores are given, and the ways in which the results are interpreted by the public. Drawing on his own experiences as a developer of numerous multiple-choice tests (such as the Iowa Silent Reading Test and the Metropolitan Achievement Test), Farr says, "I know what they can and can't do.

I think the traditional multiple-choice tests call on students to do very little production. It's ironic that these are used as tests of language, which is a productive behavior."

Farr has also been concerned with the politics of assessment and problems in persuading people to change ineffectual tests. "If tests don't really get at the production of language, why do they stay around?" he asks. "There are many political and practical reasons." The impact of testing policies goes beyond the occasional alarmed newspaper article. "Funding decisions for schools, the perceived quality of schools, and sometimes even the prices paid for homes, all depend on test scores," Farr says. For example, he says it is common practice for real estate agents to show customers the test scores for the neighborhood schools where they are considering buying a home. "Test scores," says Farr, "are taken as a valid indicator of the quality of the schools, and if the test scores are good, then the schools are assumed to be good. And if the schools are 'good,' the price of the house goes up."

Farr, who is also director of the Center for Reading and Language Studies at IUB, worries about the impact standardized test scores have on students' lives. "I don't think you should take narrowly defined instruments and use them to make crucial decisions about children's lives," he says. "The ISTEP test in Indiana, for example, defines a narrow view of reading, with little production of language called for on the part of the students, and makes student performance very 'high-stakes'; that is, important decisions are made on the basis of the tests." (The ISTEP—which stands for Indiana Statewide Testing for Educational Progress, is a multiple-choice achievement test first administered statewide in 1988, and now given in grades 2, 3, 6, 8, and 9. A student earning an ISTEP score below the sixteenth percentile usually must attend summer school and may face retention.)

"The ISTEP test is a high-profile, high-stakes test," Farr says. "The way the results are used is a misuse of a narrowly defined assessment. If the ISTEP were used in proper perspective, as one limited piece of information, it might help us understand one small part of what students have achieved in reading development."

But Farr believes that tests are offered as a solution to the school's ills because they are seen as a quick and inexpensive fix. "Many of the proposed suggestions for improving schools are beyond the budgets of state and local school districts," he says. "Lengthening the school year, raising teacher salaries, improving school libraries, and other such improvements are very costly. By comparison, the administration of a test does not take a lot of money. For example, a recent national study of school expenditures found that less than one-tenth of one percent of school expenditures are spent on assessment. So legislators conclude that they can mandate some test and leave it up to the schools as to how they are to achieve the mandated test results. What sometimes happens in these situations is that the teachers drill on the specific objectives on the test, the test scores go up—and the legislators conclude that they did the right thing. For a small amount of money they have increased achievement in the schools. The problem with that scenario is that test scores may have gone up, but students may not have learned more. Tests cannot assess all of the things a school should be trying to achieve. When we give too much weight to a single test score, we are fooling ourselves—and cheating our students."

"Assessment drives policy," Farr says. "I am sure that many people were once again shocked by the headlines this past August when the 1990 SAT (Scholastic Aptitude Test) scores were released to the media: All the business people and legislators staying in the Sheratons and Marriotts and Hyatts woke up that morning, found their complimentary copy of *USA Today* outside their hotel room doors, and what did they read on the front page? 'Verbal Scores at All-Time Low.' I am sure that the article reinforced many of their beliefs that schools are not doing a good job. Most of these people don't know a great deal about the SAT tests, and they don't have the time to dig into other data about the schools. All that they know is that the newspaper had reported that a major test given to college-bound high school seniors had documented another drop in achievement."

This interpretation is faulty for various reasons, says Farr; for one, SAT takers cannot be compared reliably across the years because the characteristics of members of the test-taking population have changed drastically and continue to change. (For example, the numbers of economically disadvantaged test takers—and of those for whom English is not a first language—have increased.) Another reason, Farr says, is that simply no proof exists that there is an overall decline in verbal skills in this country. "The SAT does not assess anything approaching basic literacy. Moreover, the decline on the SAT is measured on a standard score scale. That scale is based on a mean of 500 and a standard deviation of 100. The ratio of raw score points, or questions, to this standard score scale is about 10 to one. What this means is that last year's SAT verbal score decline of 2 standard score points equals about one-fifth of a raw score point."

Farr reports that most general reading achievement test scores have *not* been declining. "The achievement test scores in reading have been going up for decades," he says. "Indeed, if you look only at a basic level of reading ability, then it is much better today than it was 50 years ago. If we're talking

about basic reading and writing, eight-year-olds and 16-year-olds read a lot better than they did."

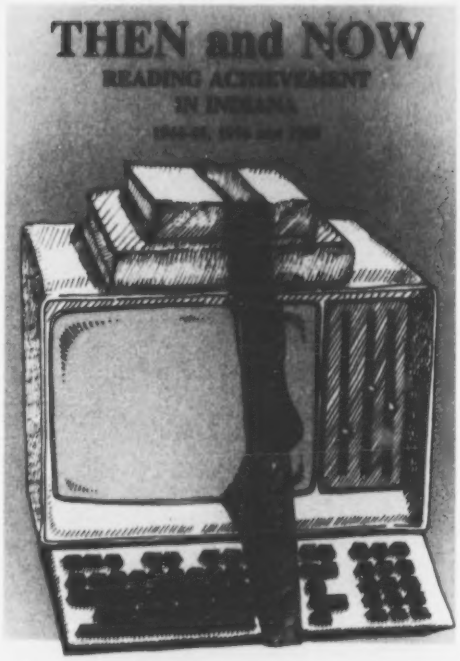
As an example, Farr points to a series of studies that he and IU education professor emeritus Leo Fay conducted of the reading achievement of Indiana sixth and tenth grade students in 1944-45, 1976, and 1986. "The sixth graders in 1986 outscored their age counterparts in 1944-45 and 1976 by a considerable margin," he says. "The situation with tenth graders was not as positive. For tenth graders, there appears to be a slight, but consistent increase in lower level reading skills, and a slight decline in the higher level reading skills. This suggests that in terms of basic literacy we are doing pretty well. There are probably more people with higher basic levels of reading and writing ability than ever before in the history of the nation. However, we do not seem to be making much headway with higher level reading and thinking skills. There are many conjectures as to why this is the case—and what can be done about it—we need to look a lot deeper than just doing a simple analysis of SAT scores. SAT scores may go up—and children may not be more literate. If we don't get beyond the 'one-test-score-sums-it-all-up mentality' and start to look more broadly at literacy, we are not going to achieve the higher literacy levels that will be needed by citizens of the twenty-first century."

In a climate where the potential for misinterpretation abounds, what are the appropriate uses of and responses to test scores? "There are three basic audiences for assessment information," Farr says. "The first, and most important, are students. If a test doesn't help kids, it shouldn't be administered. The highest level of achievement in any field is learning to be a good self-assessor, to recognize one's own weaknesses. We need to have more assessments, such as portfolios—folders or notebooks of students' reading and writing and their reactions to their reading and writing kept over an extended period—and discussions between teachers and students that show learners where they need to improve. Good teachers have always done this intuitively."

Farr says, "The second audience for assessment are teachers. Good teachers should be basing their classroom activities—the books they bring in, how they organize the instruction—on feedback from assessment. Teachers need to be constantly observing, reviewing work samples, and discussing with kids. There is not enough good informal assessment going on in classrooms. The traditional tests that we now use in schools provide teachers with less than 10 percent of what they need to know to plan instruction."

The third audience, Farr says, should be the "stakeholders"—parents, school board members, taxpayers, legislators—anyone interested in the future of the nation. "They want to know, 'How are kids learning to read and write?' And what we give them are one-time assessments based on narrow definitions of what literacy really means," he says. "We don't give them much else. I don't think the stakeholders are getting very good information about what's going on in the schools. What does it mean to the average person, or even to teachers, that in Indiana the verbal scores on the SAT declined two points or that the ISTEP scores went up or down 5 percentile points? I doubt that many know what the sixteenth percentile means—and how it is arrived at."

Farr says, "I'd like to see school districts and community organizations develop study groups to dig through the data and try to understand better what's going on. I'd like to see them ask for and collect more in-depth information about literacy development. Frankly, I am not sure they will be happy with what they find. Too often they look only for quick, superficial answers."



Roger Farr Leo Fay Jamie Myers Michael Ginsberg

INDIANA UNIVERSITY

THEN and NOW *discusses the reading achievement of Indiana sixth and tenth grade students across several decades.*

In Farr's book *Reading: What Can Be Measured?* (1969, reissued in a new edition in 1986), he writes, "The history of education seems to be one of gradual evolution rather than dramatic revolution." In 35 years of studying reading assessment, Farr has seen little to challenge this conviction. "Changes happen very, very slowly," he says. "But the approaches to teaching reading, the ways we assess, have changed over time."

One gradual change Farr has described in his writing is the growing inclusiveness of school enrollment. In *Then and Now* (1987), a comparison of 1944-45, 1976, and 1986 reading scores in Indiana, Farr writes that in 1940 the median years of school completed in Indiana was 7.5; in 1980, the

median was 12.4. "These demographic shifts must be considered in any analysis of academic achievement trends," he writes.

Approaches to reading instruction and evaluation have changed—sometimes only on the surface, but sometimes in profound ways. A recent basic change that Farr considers important is a greater emphasis on writing as a response to reading—as evidenced in his Integrated Assessment System. Writing as a reading assessment tool is not an innovation so much as a revival of an earlier approach. "Much more writing was going on in elementary and secondary schools 70 years ago," Farr says. "There weren't many kids in high school then, but those who were there were doing a lot of writing. There were few multiple-choice tests. In tests given to high school seniors in the 1920s, students were asked to write essays based on the literature they had read. Over the years, we moved away from writing to the ease and simplicity of machine-scored tests, but there now seems to be a trend in the opposite direction. It is a trend that will necessitate more expenditure of time and money. Teacher time spent assessing student's writing and talking with students about their ideas is an invaluable activity. But once again we will be faced with the issue of whether we can afford the expenditure. I know we all want better education, but I am really not certain that we are willing to pay for it."

In another study Farr analyzed essays written by 25,000 second- to twelfth-grade students. "The essays, frankly, are not bad as far as basic writing mechanics are concerned, which might surprise a lot of people," he says. "Students don't misspell a lot of words. For example, the average number of misspelled words for high school seniors is only about 2 percent on first drafts. And they are not even usually spelling errors; they're those confusing homonyms that plague everyone—'to' and 'too,' 'there' and 'their,' 'it's' and 'its.' But they also don't develop ideas in much depth, and the organization of their ideas is very confusing."

Tests cannot assess all of the things a school should be trying to achieve. When we give too much weight to a single test score, we are fooling ourselves—and cheating our students.

Writing problems, Farr believes, have little to do with those traditionally tested mechanical skills of writing assessed by the fill-in-the-bubble tests. "It's the thinking and the organization of ideas that seem to be the problem," he says. "And those are the things we miss with our traditional tests. If we don't assess those skills, they may not get taught. That means we should be developing new forms of assessment that attempt to get at some of these thinking and organization abilities that students lack."

Farr first began writing standardized tests in the early 1970s, when Harcourt Brace Jovanovich published the book *Measurement and Evaluation of Reading*, a collection of articles that he had edited. Recognizing the scope of his research on assessment, The Psychological Corporation, a division of Harcourt, asked Farr to develop two of their products, the Iowa Silent Reading Tests (ISRT) and the Metropolitan Achievement Test (MAT). Harcourt is also the publisher of the Integrated Assessment System. In addition, Farr has worked on the General Educational Development Test (GED).

Much of Farr's current research deals with metacognition—thinking about thinking. A research team has asked students in the fourth and seventh grades to describe what they are thinking about as they take traditional reading tests—and as they read narrative and expository texts. Their descriptions are called "think-alongs." Like all Farr's work, the experiment seeks to determine how best to assess the thinking aspects of reading, which Farr defines as "thought guided by printed symbols."

Nina Targovnik, a doctoral student in the School of Education and a member of the research team, says of the project, "The assessment of kids' think-alongs has the potential to give us some insight as to *how* kids are reading. If we can figure out the process instead of only focusing on the product—on right answers—it might help teachers to focus on teaching what is really important in reading—the process." Targovnik, who has analyzed the written and verbal think-alongs from nearly a thousand students, says the experiment reveals three general categories of processes that occur during reading—simply restating what has been read, adding background knowledge and experiences to the ideas, and reinterpreting the ideas from different perspectives. She finds that, "these findings support previous research about thinking processes during reading, but what we are doing is trying to figure out if we can assess those behaviors so

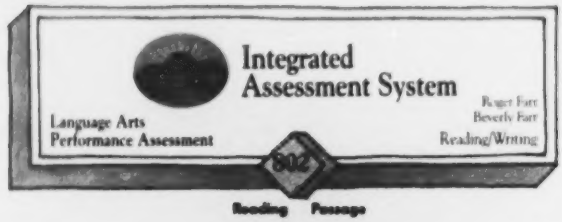
that schools and teachers will have information that will tell them how students read—rather than just how well they read. After all, what teachers need to teach is the how of reading—and then the how well will take care of itself."

Having devoted his career to studying Americans' reading skills, Farr takes exception to portrayals of the literacy rate in the popular media. "Those reports don't mean very much," he says. "Most of the media hype about functional illiteracy comes from one rather flawed study done at the University of Texas. That study is the one that came up with the figure '23 million functional illiterates in the United States.' The study really dealt with dysfunctional adults, people who couldn't fill out a checkbook, for example. When the Ad Council decided to support the movement to eliminate adult illiteracy, it began using that number in its advertisements. Later the figure was raised to 29 million." Farr looked into the increase and found that public relations writers had adjusted the already questionable figure upward to correspond to the growth in the U.S. population. "I just don't think that the way to move ahead is by misidentifying the problem," he says.

Farr is concerned less with giving a number to the nation's "illiterates" (a vague term at best) and more with determining what essential skills people lack. "Literacy is the degree to which someone is able to merge all the language systems—reading, writing, listening, speaking, and even music, art and drama," Farr says. "When we think about literacy, we almost always focus just on reading and writing. We know that what is being demanded in society in terms of literacy is far greater. If someone were to say, 'Can most people in the U.S. read and write today?' my answer would be 'yes.' But can they use all of their literacy skills well enough to meet the demands of the jobs they'll be faced with 10 to 15 years from now? My answer would be 'I don't think so, but I don't know for sure.' "

"In all of my work, I try to emphasize the connections between language systems," Farr says. "I've tried to develop tests that determine whether a student can use reading, writing, listening, and speaking to accomplish a task. We encourage student collaboration, use of reference sources, revision, and personal opinions. To build such tests so that they can be used in large-scale testing programs has been a big challenge, but I think we are on the way. I guess these tests come closest of any test that I've ever developed to being a true literacy test, but they are not a complete test of literacy. There is no such thing—and probably never will be. All of our tests are nothing but faint imitations of real literacy."

—*Karen L. Grooms*



JOURNEYS TO THE MOON

Cover illustrations from tests developed by Roger Farr. "In all of my work, I try to emphasize the connections between language systems. I've tried to develop tests that determine whether a student can use reading, writing, listening, and speaking to accomplish a task."

Heavy Steps
by Roger Farr

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Indiana at Risk

Carlyn Johnson, Professor of Public and Environmental Affairs, Indiana University-Purdue University at Indianapolis

Indiana Education Policy Center

Ms. Jacobs sits surrounded by her fourth-grade class and listens while Rebecca struggles to read aloud. The teacher's mind wanders. She knows she should give Rebecca individual attention because the child is falling behind. In her mind, Ms. Jacobs surveys the day's schedule and finds no time. She fast-forwards to tomorrow and the remaining days of the week—no time. The reading circle grows silent. Ms. Jacobs then snaps back to the present, smiles, and helps Rebecca pronounce a word correctly. Last year a teacher's aide tutored students like Rebecca. This year, as in many other schools in Indiana, teacher's aides were cut from the budget.

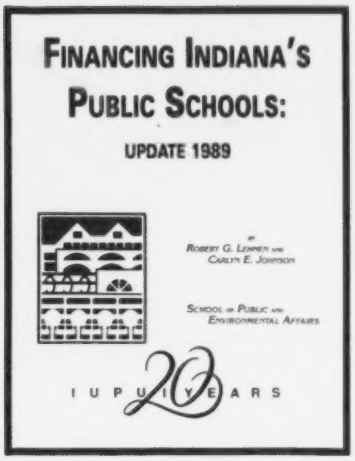
The plight of teachers like Ms. Jacobs is all too familiar to Carlyn Johnson. A professor of public and environmental affairs at Indiana University-Purdue University at Indianapolis, and associate director of the Indiana Education Policy Center at IUPUI, Johnson has devoted her career to studying—and removing—the flaws in Indiana's school funding system. Johnson may be one of the few people in the state who thoroughly understands the finance formula, which was enacted in 1973, and which provided that "Each school's state distribution is equal to its prior year's property tax levy plus its prior year's grant from the state plus some additional state-provided guarantee minus the amount the school was allowed to raise from the property tax."

What Johnson understands most about the formula is its inequity from school system to school system and the resulting inequality of educational opportunity. Although funding for elementary and secondary education has increased 25 percent in the last few years, it still falls short of educational needs. The shortfalls effect many schools but are not equal in impact. Some schools cut "luxuries"; others cut basic instruction. Not only are the results unequal, but, Johnson has found, overall spending is also inadequate. "Indiana is way behind in most measures in terms of elementary and secondary education. We don't spend as much money as other states, and by whatever measures you can find, we fall in the bottom third or the bottom quarter of the states," says Johnson, a watchdog of legislative appropriations to schools and a champion of schools's rights to a say in how their dollars are spent.

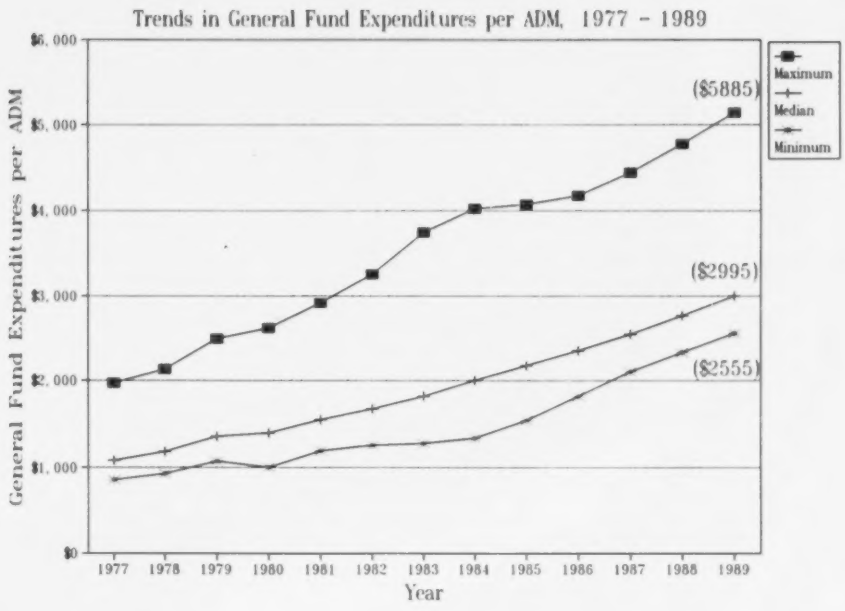
After earning a history degree from Cornell University, Johnson, then a student at the IU School of Law—Indianapolis, became a research assistant at the Indiana Commission on State Tax and Financing Policy. In 1965 she returned to that commission as its director. From 1969 to 1971 she served as director of the Indiana Continuing Legal Education Forum and on the faculty at the IU School of Law—Indianapolis, and from 1971 to 1973 she was Assistant State Superintendent of Public Instruction (Finance and Research). Reflecting on these experiences, Johnson says it was her internship with the Indiana Commission on State Tax and Finance Policy, made possible by a Ford Foundation grant, that led her to build her research around state tax and finance policy and its influence on schools.

In 1984, working with Robert Lehnen, co-director of the Indiana Education Policy Center at Indianapolis, Johnson began tracking the effects of Indiana's 1973 property tax freeze on school funding. Johnson and Lehnen have published two reports based on their research, *Financing Indiana's Public Schools: An Analysis of the Past and Recommendations for the Future* (1984), and *Financing Indiana's Public Schools: Update 1989*. The results are not encouraging, according to Johnson.

She explains that before 1973 a "foundation" formula was used that allowed every school system to impose a given property tax rate. While the state ensured that each school had a certain amount of money to spend per student (a foundation), that amount was never enough to cover actual costs, so schools raised additional sums



Johnson and Lehnen report that in 1989 the highest spending school in Indiana spent more than twice as much per pupil as the lowest spending school, as seen in the graph at right.



from local property taxes. Because property tax is based on assessed valuations of property, wealthy communities with a high assessed valuation per pupil could raise a lot of money for their schools (often with a small tax increase), but poorer communities could not—or required a much larger tax increase to meet similar needs. Johnson says that by 1973 there was a pattern of wealthy schools being the high spenders. That inequity was frozen into the system with the property tax freeze and still exists today, 18 years later.

"The legislature since then has made an effort to bring the bottom up, and they have done that," says Johnson, "but they have not kept the top from going up, so the discrepancies between the low and the high spenders are as bad as they were, and maybe even worse than before."

Schools who are the low spenders no longer have the option of raising more money. With the present formula the legislature has set the amount a school can raise from property taxes. The only way to circumvent the restrictions of the formula is to hold a voter referendum. Such referenda have been highly unsuccessful.

"What we've said in both the 1984 and the 1989 study is that now it's time for the legislature to start looking at educational needs," Johnson explains. Johnson and Lehnen's reports discuss in detail the changes in school funding policy that the Indiana legislature has initiated. "We've tried to determine what the legislature's goals were with each of these changes and then looked at whether or not those goals have been met," Johnson says.

"It seems as if you should base your formula on what school corporations think they should be doing. If they need more computers, why can't they get them? If they want to add courses, why can't they? Suppose, for example, you live in a community like Lafayette, which has a big Japanese plant coming in, and you want to add Japanese to your curriculum. The only way you can do that, given the funding limitations, is by doing away with something else."

School corporations are not prevented by law from making changes, Johnson says; they are prevented by lack of funds. In 1973, the state legislature took control of school funding away from local school corporations and left them powerless to make decisions about spending—powerless to be responsive to individual community needs. Sometimes those needs extend beyond curriculum and into social services. Schools must cope with family problems, nutritional needs, and drug and alcohol abuse.

"There are lots of people who say money doesn't make any difference," Johnson says. "Well, it does make a difference. If you've got adequate funds, you can buy more computers for your kids, you can have a broader program. You can add different kinds of classes. You can lower your student-to-teacher ratio. You can probably pay your teachers more and presumably get better teachers, although that's obviously open to some question."

Johnson and Lehnen maintain that these decisions should be made locally. Johnson hopes her research will be used to solve such problems. "I don't care whether the research that I do is published in refereed journals," she says. "What I care about is whether the General Assembly reads it and takes action based on it."

The geographical location of industrial plants and other commercial property accounts for the wide variations in property tax wealth per student.

"I think I've had some success in that. The two finance studies certainly led the General Assembly to make some changes in the formula. I'm not sure they were the right changes, but the reports led to them."

By 1985, the tax reform of 1973 had succeeded in reducing property taxes, but variations in rates had increased. State funds, instead of property tax, had become the main source of school funding, but "per-pupil expenditure differentials" among school districts had increased. In 1986 the General Assembly added two new provisions to the school funding formula to reduce the expenditure differential. One provision established a minimum guarantee per pupil, and the other established a "target equalization factor" that would equalize per-pupil expenditures within 10 years. The first provision continues today. The second provision "grandfathered" the rights of schools operating above the target expenditure level to maintain and increase their level of funding. Because it was ineffective, the "target equalization factor" was abandoned entirely in 1989, and the disparity of funding grows.

And the disparity is wide. For example, in 1991 the wealthiest school corporation in the state had more than $145,000 assessed valuation of property behind each pupil while the poorest had just under $9,000. State funding statutes allowed each school to increase its general fund property tax rate in 1992 by eight cents. Thus the wealthiest school could increase its expenditures by $116 per pupil, 16 times more than the poorest, where eight cents added to the tax rate could raise only $7 per pupil.

These kinds of disparities are not new, but they are increasing. In 1987 the Lake Central School Corporation in Lake County, Indiana, filed a lawsuit, since joined by 50 additional school corporations, alleging that such disparities render the school distribution formula unconstitutional. The case was set for trial in September of 1991, postponed to September of 1992, and is still pending. "Fifty-one out of 296 school corporations in the whole state is a fair percentage of schools that feel things are not right," says Johnson.

She continues, "There has been a rash of these suits around the country. Recently the highest court in the state of Kentucky declared that state's whole education system unconstitutional. I think a lot of schools have felt that they were being treated poorly or unfairly."

The inequities from county to county and region to region are striking. There is a case for the view that this financial inequity sooner or later translates to inequity in educational quality. Johnson says such drastic measures as lawsuits might get the legislature to pay attention to the public's concerns. "I think the legislature is listening. It's just that school finance decisions are political, not Democrat or Republican, but political with a small 'p.' Besides, schools cost a lot of money. Close to 40 percent of the state's general fund budget in any given year is for elementary and secondary schools," Johnson says.

"School finance decisions are difficult, so it's not that I'm unsympathetic. A good equalization formula was proposed by the State Department of Education and introduced in the 1991 session, but unfortunately it didn't go anywhere. The legislature didn't respond because it cost money, and we're in pretty stringent financial times."

After their 1989 study, Johnson and Lehnen saw the need for continued funding for school finance studies and other educational issues. The Indiana Education Policy Center is a direct result of their efforts. They approached the Lilly Endowment with the idea and subsequently coauthored a joint proposal with the School of Education in Bloomington that brought the $2.3 million grant to fund the center offices on the Bloomington and Indianapolis campuses. Lehnen says, "There are some 20 university-based centers around the country, but we are unique because we are an eight-campus-wide operation." The center is cross-disciplinary, bringing together people in public management and public policy from the Schools of Education and Public and Environmental Affairs.

Discussing his work with Johnson, Lehnen says, "Carlyn's range of activities includes research, interface with stakeholders around the state, and contact with the legislative and executive branches. She has a lot of credibility in those circles. She takes her expertise, applies it to public problems, and creates research and a knowledge base that translate into actions that public decision makers can take. She labored in the vineyards, improving education from the financial side long before it was fashionable."

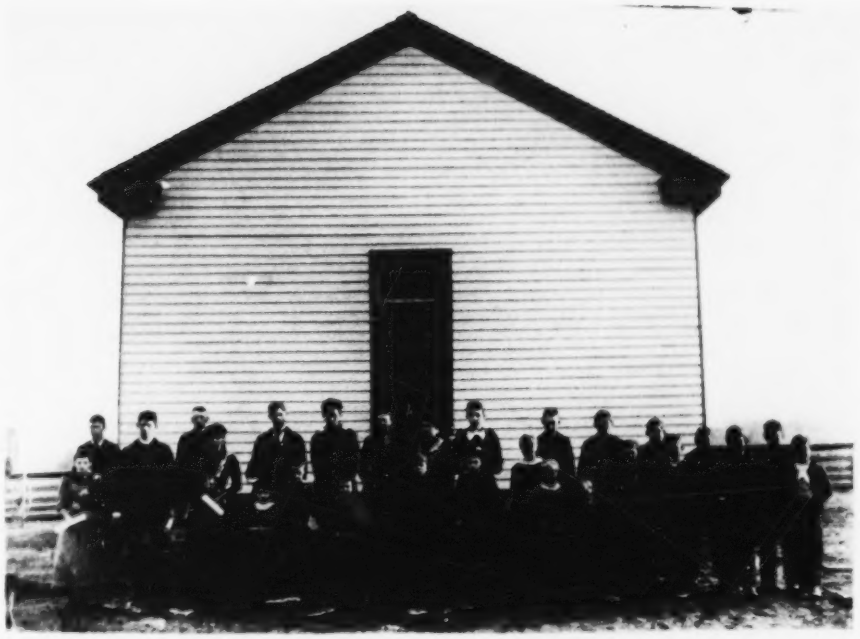
The officially stated mission of the Indiana Education Policy Center is to provide "nonpartisan research on education issues to Indiana policy makers and other education stakeholders to improve education. The research agenda at the Indianapolis office focuses

primarily on school finance, school performance indicators, education policy and economic development, and related education issues."

One of Johnson's projects through the center was to organize focus groups. She explains, "In an effort to try to help legislators in their thinking about what ought to be done with the formula, we had a series of five focus groups around the state. We included teachers, school administrators, business representatives, parents, students, legislators, local political leaders, retired individuals, economic development officials, and the media. We posed this question to them: 'What should be the goals of the school distribution formula?' "

Results from the focus groups were published last year in a policy bulletin of the center entitled, *Citizen's Views of Indiana's School Finance Formula: A Focus Group Report*. Their input fell into four major categories. According to the participants, the goals of the school funding formula should be: 1) equity—achieving equality of educational opportunity; 2) local flexibility—giving each school district the ability to raise and spend funds where needed; 3) resources—providing school districts with sufficient funds to increase the average per-pupil expenditures to the national average; and 4) accountability—setting education goals and regularly measuring each school district's progress toward achievement of those goals.

A graduate student who worked with Johnson on the focus group project, John Griffiths, says, "It's fun to watch her work. She's extremely busy with a number of organizations and groups. She approaches her research with her legal, professional intuition, and is open to discussion when opinions on an issue differ. The school funding system is complex, and it's been a hard-fought battle." Griffiths, a third-year law student at the Indianapolis campus, also worked under Johnson's editorship on the *SPEA Review*. He also did research related to the pending Lake County lawsuit.



An unidentified one-room schoolhouse in Indiana circa 1880; photograph taken by Louis Scheidler of Millhousen, Indiana, in Decatur County.

Hoosiers students face an uncertain future as they head into the next century.

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Susan Wood, who recently completed her graduate work in public and environmental affairs, has also worked with Johnson on a variety of projects—including the 1989 school finance update and the organization of the focus groups. Wood says one of Johnson's strengths is her ability to pull people together. "I learned how to work with people and how to work in the public policy and public administration field," Wood says. "She gives you the latitude to develop your own ideas. Carlyn is very civic-minded, caring about what goes on beyond the academic world, caring about the city. She's good at bringing together politically different factions and getting them to talk." In fact, in an effort to put into practice what she has been talking about for 30 years, Carlyn Johnson recently announced her name will be on the ballot in May for the Metropolitan School District of Lawrence Township in Marion County.

Another result of Johnson and Lehnen's research is a video sponsored by the Lilly Endowment, *Indiana's Educational Challenge: From Backbone to Brainpower*. The video has been widely distributed to educational groups, business and community groups, and policy makers. It covers the history of Indiana public education and illustrates the state's changing needs as the economy has moved from agricultural pursuits to heavy industry and thereafter to today's service and high-tech industries. The video explores the attitudes, priorities, and financing of education through the years.

According to the video, the Indiana Department of Education estimates that Hoosiers have less formal education than most people in the nation. One out of five Hoosier adults cannot read or write well enough to be considered functionally literate. One of three never graduated from high school, a much higher figure than the national average. Indiana is near the bottom of states on SAT scores; few Indiana residents are college graduates.

The decision in terms of public policy is whether to invest today in schools and educational programs, or to spend tomorrow for unemployment and welfare programs.

While funding has increased 25 percent in the last few years, Indiana spends less per student than most other states. To catch up, the video estimates Indiana needs to increase funding by 9 to 10 percent in each of the next 10 years.

The video surveys representatives from agriculture, industry, business, government, the military, and education. The recurring theme is the great need for improved education in Indiana. Attitudes of policy makers and students alike must change, the video asserts, because "a strong back and a commitment to hard work are no longer enough." Tomorrow's jobs will require "smart" work.

Although today's industries have resorted to teaching basic skills to their workers because they have no choice, they will not continue to do so. Applicants will be tested, and only those whose proficiencies go beyond the "3 Rs" will get jobs. And the need for an educated work force does not stop with industry. From farming to the military to service jobs, computer literacy and critical thinking skills have become staples for success. The attitude of employers of tomorrow is summed up in the comments of an industrial representative featured in the video: "We are digging a hole for ourselves relative to the education being provided to our competitors in the rest of the world." The video concludes that the funding formula should be based on "solid educational goals and a rational way to achieve them."

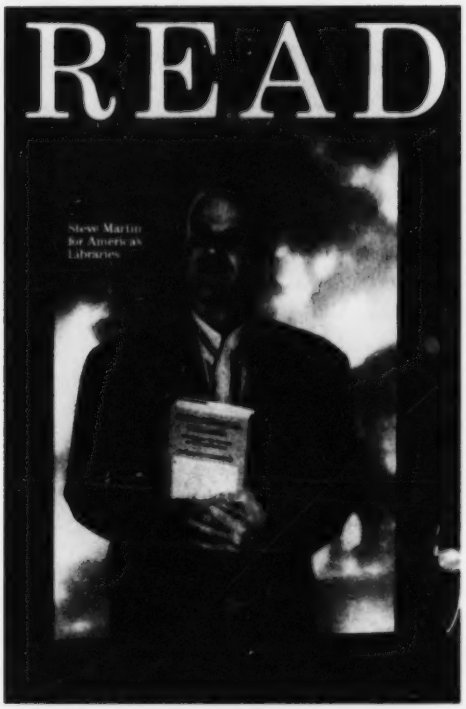
All this talk about spending may make legislators and taxpayers nervous, but Johnson is convinced that public education is a worthwhile investment. In her 1985 study, *A Generation at Risk*, Johnson writes, "The evidence is clear. Poor children, minority children, children in single-parent families, and children with poorly educated parents are the ones most likely to fail. These are the children who need to benefit most from our public education system. And the tragedy is that in the future, the number and percentage of children with these characteristics are increasing very rapidly."

Johnson says, "I think it's fair to say that while that study [*A Generation at Risk*] was not the sole thing, it really did act as a catalyst for the Indiana General Assembly to appropriate some money for children at risk. After that study came out, and ever since then, there has been an appropriation for those kinds of kids. I'm pleased with that."

In the same report, Johnson states, "If the immediate problem is ignored, then the data and commentary describe and predict the next generation of America's welfare class. The decision in terms of public policy is whether to invest today in schools and educational programs, or to spend tomorrow for unemployment and welfare programs."

Although Johnson was concentrating on those students most likely to fail in *A Generation at Risk*, her observations ring true for most Indiana public school students. School funding, with its shortfalls and its inequities, may be placing Indiana "at risk."

—*Linda Hancock*



Actor Steve Martin, holding a book by IUB Professor Douglas Hofstadter.

Photos of Steve Martin and Isiah Thomas are two examples of the American Library Association's celebrity READ posters, an ongoing campaign to increase public awareness of reading and libraries. To order the posters ($6 each) or to receive a free catalog, write ALA Graphics, American Library Association, 50 E. Huron St., Chicago, IL 60611. Payment must be enclosed with orders.

The joy of reading begins early.

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